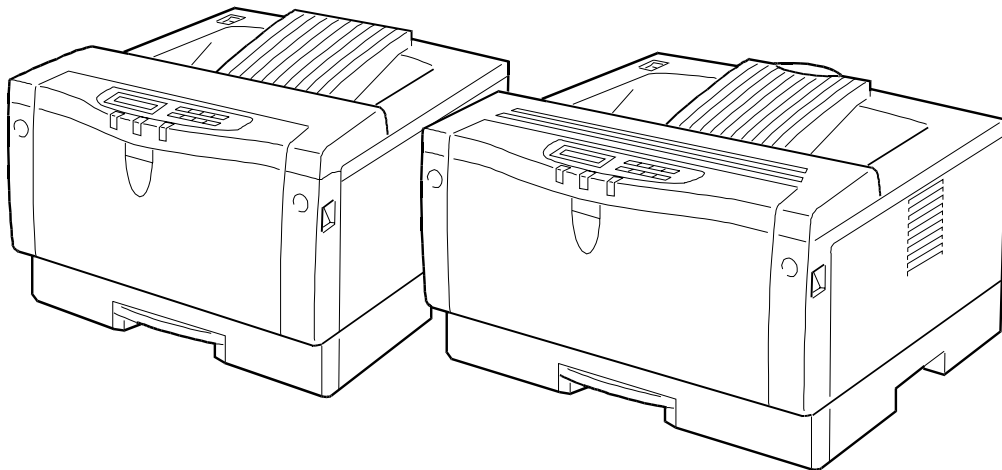


***Gestetner***<sup>®</sup> **RICOH**<sup>®</sup> **SAVIN**<sup>®</sup>



# **G031/G032/G049/G054**

## **SERVICE MANUAL**

RICOH GROUP COMPANIES

000832MIU

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

*Gestetner*<sup>®</sup>

**RICOH**<sup>®</sup>

**savin**<sup>®</sup>

**G031/G032/G049/G054  
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000832MIU

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## **WARNING**

***The Service Manual contains information regarding service techniques, procedures, processes and spare parts of office equipment distributed by Ricoh Corporation. Users of this manual should be either service trained or certified by successfully completing a Ricoh Technical Training Program.***

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***Ricoh Corporation***

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

# LEGEND

PRODUCT CODE	COMPANY		
	GESTETNER	RICOH	SAVIN
G031	P7020	AP2000	SLP20
G032	P7014	AP1400	SLP14
G049	P7021	AP2100	SLP21
G054	P7016	AP1600	SLP16

# DOCUMENTATION HISTORY

REV. NO.	DATE	COMMENTS
*	5/99	Original Printing
	4/2000	G049/G054 Addition

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

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## **G049/G054 SERVICE MANUAL**

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## **IMPORTANT SAFETY NOTICES**

### **PREVENTION OF PHYSICAL INJURY**

1. Before disassembling or assembling parts of the printer and peripherals, make sure that the printer power cord is unplugged.
2. The wall outlet should be near the printer and easily accessible.
3. If any adjustment or operation check has to be made with exterior covers off or open while the main switch is turned on, keep hands away from electrified or mechanically driven components.
4. If a print job has started (the Data In LED has started blinking) before the printer completes the warm-up or initializing period, keep hands away from the mechanical and electrical components because the printer starts making prints as soon as the warm-up period is completed.
5. The inside and the metal parts of the fusing unit become extremely hot while the printer is operating. Avoid touching those components with your bare hands.

### **HEALTH SAFETY CONDITIONS**

Toner is non-toxic, but if you get it in your eyes by accident, it may cause temporary eye discomfort. Try to remove with eye drops or flush with water as first aid. If unsuccessful, get medical attention.

### **SAFETY AND ECOLOGICAL NOTES FOR DISPOSAL**

1. Do not incinerate the toner cassettes. Toner dust may ignite suddenly when exposed to an open flame.
2. Dispose of toner cassettes in accordance with local regulations. (This is a non-toxic unit.)
3. Dispose of replaced parts in accordance with local regulations.

## LASER SAFETY

The Center for Devices and Radiological Health (CDRH) prohibits the repair of laser-based optical units in the field. The optical housing unit can only be repaired in a factory or at a location with the requisite equipment. The laser subsystem is replaceable in the field by a qualified Customer Engineer. The laser chassis is not repairable in the field. Customer engineers are therefore directed to return all chassis and laser subsystems to the factory or service depot when replacement of the optical subsystem is required.

### **WARNING**

**Use of controls, or adjustment, or performance of procedures other than those specified in this manual may result in hazardous radiation exposure.**

### **WARNING FOR LASER UNIT**

**WARNING:** Turn off the main switch before attempting any of the procedures in the Laser Unit section. Laser beams can seriously damage your eyes.

**CAUTION MARKING:**



**OVERALL INFORMATION G031/G032****PAPER FEED UNIT G914/G915**TAB  
POSITION 1**DETAILED DESCRIPTIONS G031/G032****NETWORK INTERFACE BOARD G919**TAB  
POSITION 2**INSTALLATION G031/G032****G049/G054 SERVICE MANUAL**TAB  
POSITION 3**SERVICE PROCEDURES AND TABLES G031/G032****APPENDIX**TAB  
POSITION 4**PREVENTIVE MAINTENANCE G031/G032**TAB  
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POSITION 6**TROUBLESHOOTING G031/G032**TAB  
POSITION 7**ENVELOPE FEEDER G913**TAB  
POSITION 8

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# OVERALL INFORMATION

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# 1. OVERALL MACHINE INFORMATION

## 1.1 SPECIFICATIONS

Configuration:	Desktop
Print Process:	Laser beam scanning & electrophotographic printing Monocomponent toner development
Printing Speed (600 dpi):	G031: Maximum 20 pages per minute (A4/LT LEF) G032: Maximum 14 pages per minute (A4/LT SEF) <b>NOTE:</b> LEF, long edge feed. SEF, short edge feed
First Print Speed:	G031: 5.5 s or less (A4/LT - LEF, standard tray) G032: 6.5 s or less (A4/LT - SEF, standard tray)
Resolution:	True 1,200 x 1,200 dpi (available for PCL6 or PostScript) 600 x 600 dpi 300 x 300 dpi (simulated by doubling pixel width and height at 600 dpi resolution)
Printer Language	PCL6/PCL5e Compatible with Laser Jet 5N driver and printer. Windows 3.1x/95/98, Windows NT4.0 drivers available. PostScript Level II Windows 95/98, Windows NT4.0, and Macintosh (OS 7.5 or later) PPDs are available.
Printer Fonts:	PCL6 35 Intellifonts 10 True Type fonts 1 Bitmap font PS2 35 Adobe type 1 fonts
Printer Interface:	Bi-directional IEEE1284 parallel x 1 (Standard) Ethernet (100 Base-TX/10 Base-T for TCP/IP, IPX/SPX, EtherTalk) RS232C interface (Optional)

## Printing Paper Size:

## G031:

Maximum A3/11" x 17"

Minimum A5 LEF - Standard Tray

B6 SEF - By-pass Tray

A5 LEF - Optional PFU

Custom paper size (PCL 6/PS): By-pass Tray

11.69" x 17" ~ 3.88" x 5.83"

(297 x 431.8 ~ 98.4 x 148 mm)

Envelope: By-pass &amp; Envelope Feeder

Com#10, C6, DL, Monarch

## G032:

Maximum A4/LG (only A4/LT for Standard Tray)

Minimum A4/LT – Standard Tray

B6 SEF - By-pass Tray

A5 LEF - Optional PFU

Custom paper size (PCL 6/PS): By-pass Tray

8.5" x 14" ~ 3.88" x 5.83"

(216 x 355.6 ~ 98.4 x 148 mm)

Envelope: By-pass &amp; Envelope Feeder

Com#10, C6, DL, Monarch

## ⇒ Printing Paper Weight:

Paper tray: 60 ~ 90 g/m<sup>2</sup>, 16 ~ 24 lbBy-pass: 60 ~ 162 g/m<sup>2</sup>, 16 ~ 43 lb

## Power Source:

## G031:

120 V, 60 Hz: More than 8.0 A (for North America)

220 V ~ 240 V, 50/60 Hz: More than 8.0 A (for Europe)

## G032:

120 V, 60 Hz: More than 6.0 A (for North America)

220 V ~ 240 V, 50/60 Hz: More than 5.0 A (for Europe)

## Power Consumption:

	<b>G031</b>	<b>G032</b>
Maximum	795 W or less	600 W or less
Printing	480 W or less	380 W or less
Energy Saver	30 W or less	30 W or less

## Noise Emission (All Options Installed):

	<b>G031</b>	<b>G032</b>
<b>Sound Power Level</b>		
Printing	64 dB or less	59 dB or less
Stand-by	48 dB or less	48 dB or less

**NOTE:** The above measurements were made in accordance with ISO 9296 at the operator position.

## Dimensions (Printer only):

	Width	Depth	Height
G031	450 mm (17.7")	420 mm (16.6")	270 mm (10.6")
G032	360 mm (14.2")	420 mm (16.6")	270 mm (10.6")

Weight:	G031: Less than 15 kg (33 lb.) G032: Less than 12 kg (27 lb.)
Warm-up Time	Less than 39 seconds: 23°C
Energy Saver Mode	30 min. is the standard setting; it can be changed with the Job Control menu
Print Paper Capacity:	Standard Tray: 250 sheets By-pass Tray: 100 sheets 10 envelopes (G031) 5 envelopes (G032) Optional Paper Feed Unit: 500 sheets x 2 (G031) 500 sheets x 1 (G032) Optional Envelope Feeder: 60 envelopes
Memory:	Standard 8 MB, up to 40 MB with optional SIMM.

## Toner Cartridge Information:

G031		G032	
Pre-set Toner Cartridge	Commercial Toner Cartridge	Pre-set Toner Cartridge	Commercial Toner Cartridge
Average 3,000 pages/crtg.; 200g	Average 14,000 pages/crtg.; 750g	Average 3,000 pages/crtg.; 200g	Average 8,000 pages/crtg.; 430g

Measurement Conditions:

- 1) 5% test pattern
- 2) A4 paper
- 3) LEF for G031, SEF for G032
- 4) Continuous printing

Optional Equipment:	<ul style="list-style-type: none"> <li>• A3/DLT paper feed unit (unique for G031)</li> <li>• A4/LT paper feed unit (unique for G031)</li> <li>• Paper feed unit (unique for G032)</li> <li>• Envelope feeder (unique for G031)</li> <li>• Envelope feeder (unique for G032)</li> <li>• Network Interface Board</li> <li>• 1.6 GB HDD unit (hard disk drive unit)</li> <li>• RS232 board</li> </ul>
---------------------	--

Output Paper Capacity:	250 sheets
------------------------	------------

SPECIFICATIONS

Utility Software  
(Main frame CD-ROM):

- Printer Drivers
- PS PPD files
- Font Manager
- Aficio Manager
- Operating Instructions (G031/G032 -22, -27, -29)

Utility Software  
(Optional Network Interface  
Board):

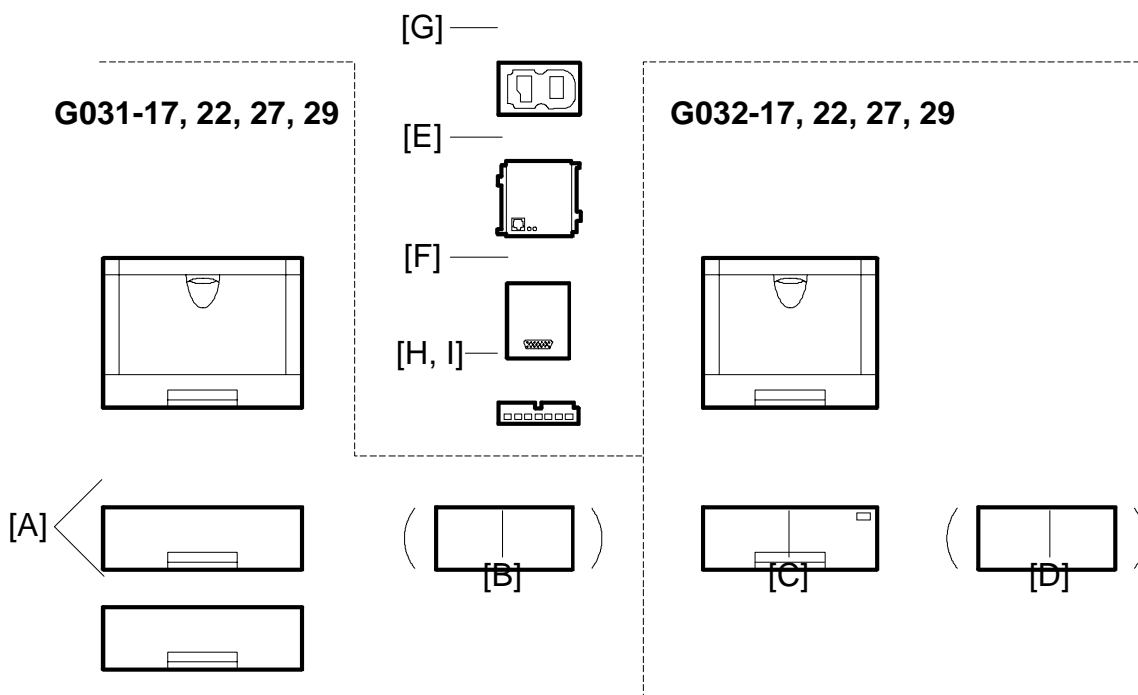
- IP-P2P
- IPXP2P
- MAP
- Bootpl
- NW setup
- NIB User's Manual
- Acrobat Reader

Maintenance Kit:

- Fusing Unit x 1
- Transfer Unit x 1
- Friction Pad x 1
- Paper Feed Roller x 3 (G031)
- Paper Feed Roller x 1 (G032)

## 1.2 MACHINE CONFIGURATION

### Internal Options



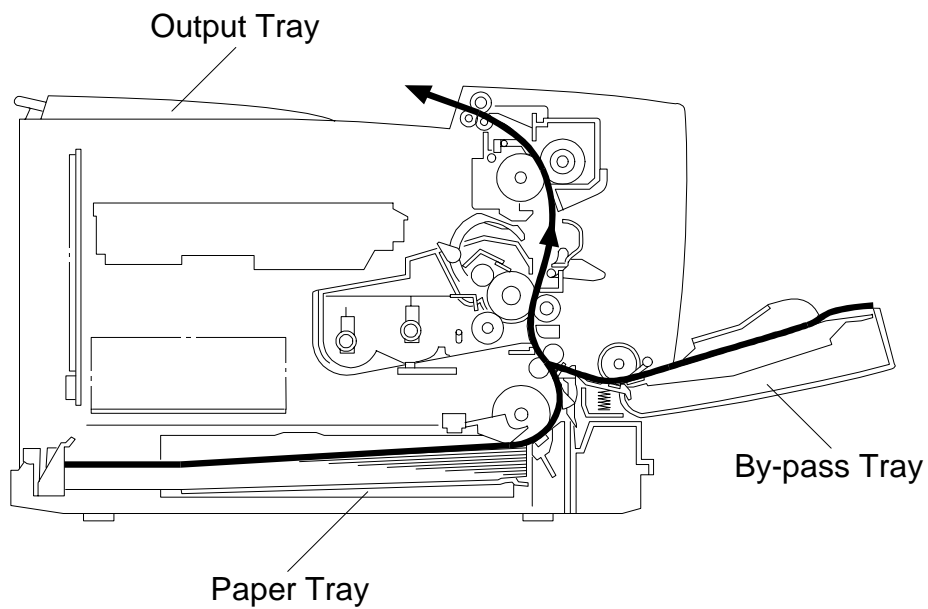
No.	Item	Machine Code
<b>G031</b>		
A	Paper Feed Unit Type 2000 (A4/LT) Paper Feed Unit Type 2000 (A3/DLT)	G915-17, -27 G914-17, -27
B	*Envelope Feeder Type 2000	G913-17
<b>G032</b>		
C	Paper Feed Unit Type 1400	G914-57
D	Envelope Feeder Type 1400	G913-57
<b>Internal Options</b>		
E	Network Interface Board Type 2000	G919-17
F	RS232C Board Type 2000	G527-17
G	Hard Disk Drive Type 2000	G690-17
H	Memory Unit Type 204 (16 MB)	G688-04
I	Memory Unit Type 204 (32 MB)	G688-05

**\*NOTE:** The envelope feeder for the G031 can only be installed in place of the optional 2nd paper tray.

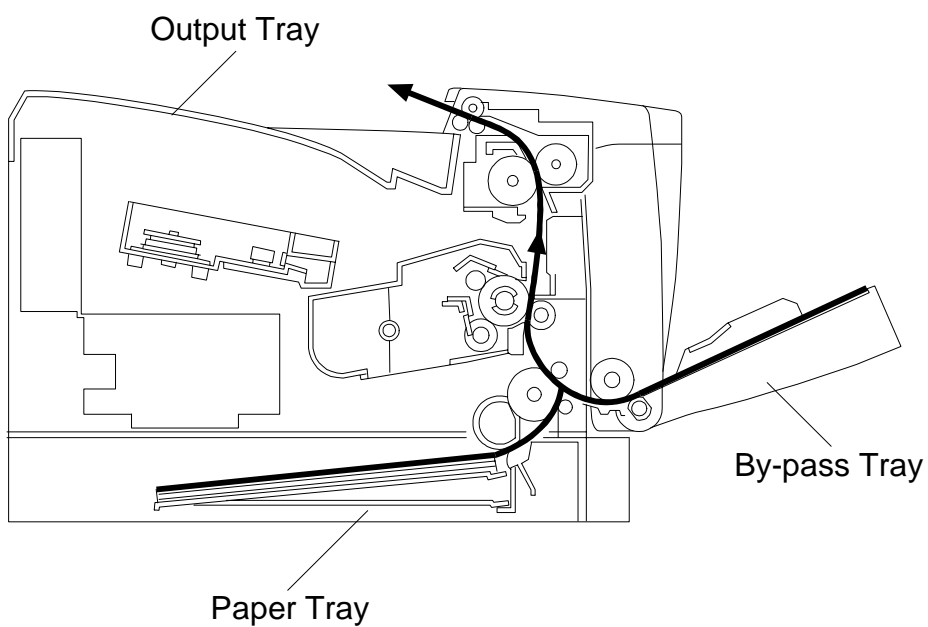
PAPER PATH

## 1.3 PAPER PATH

### G031



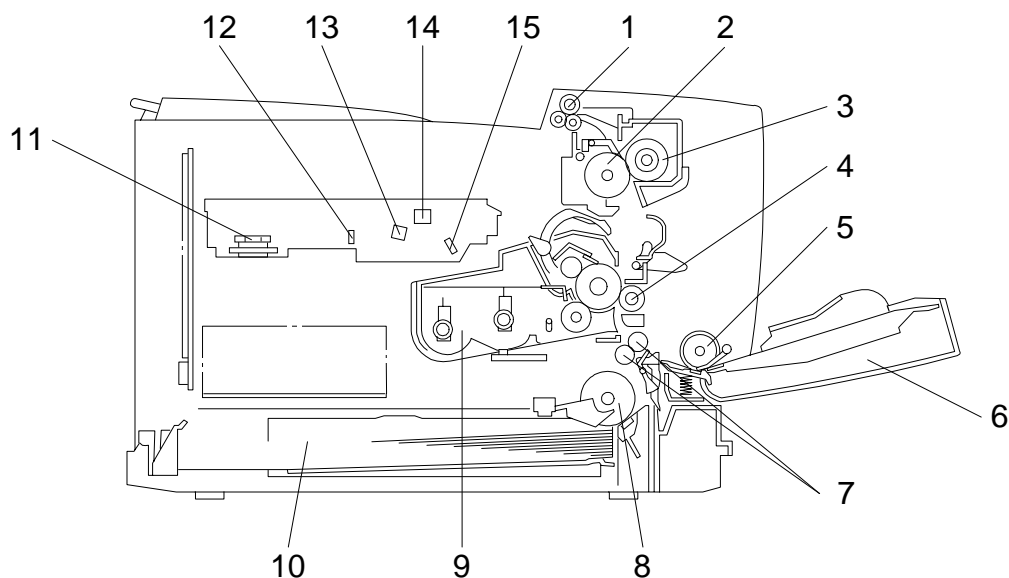
### G032



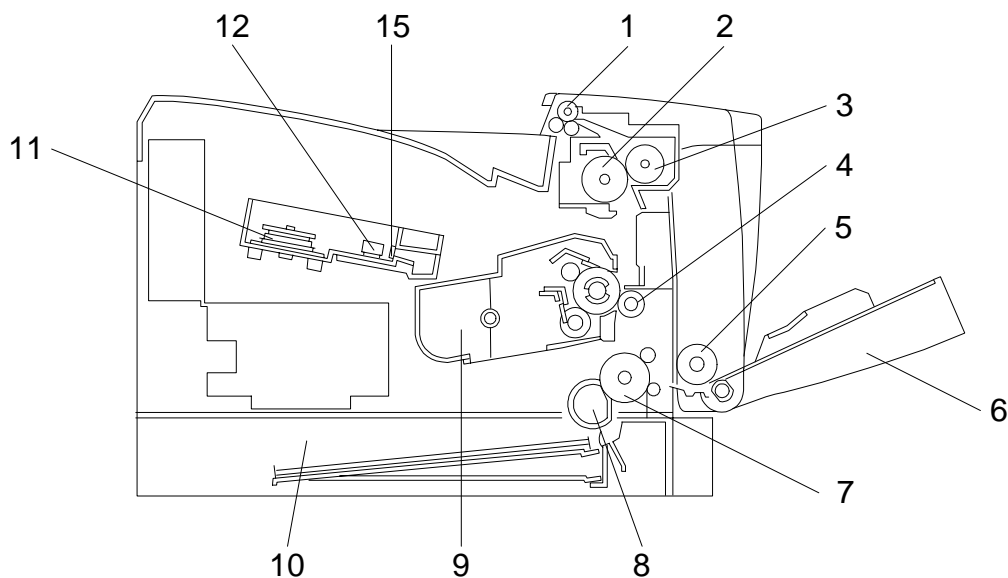


## 1.4 MECHANICAL COMPONENT LAYOUT

### G031



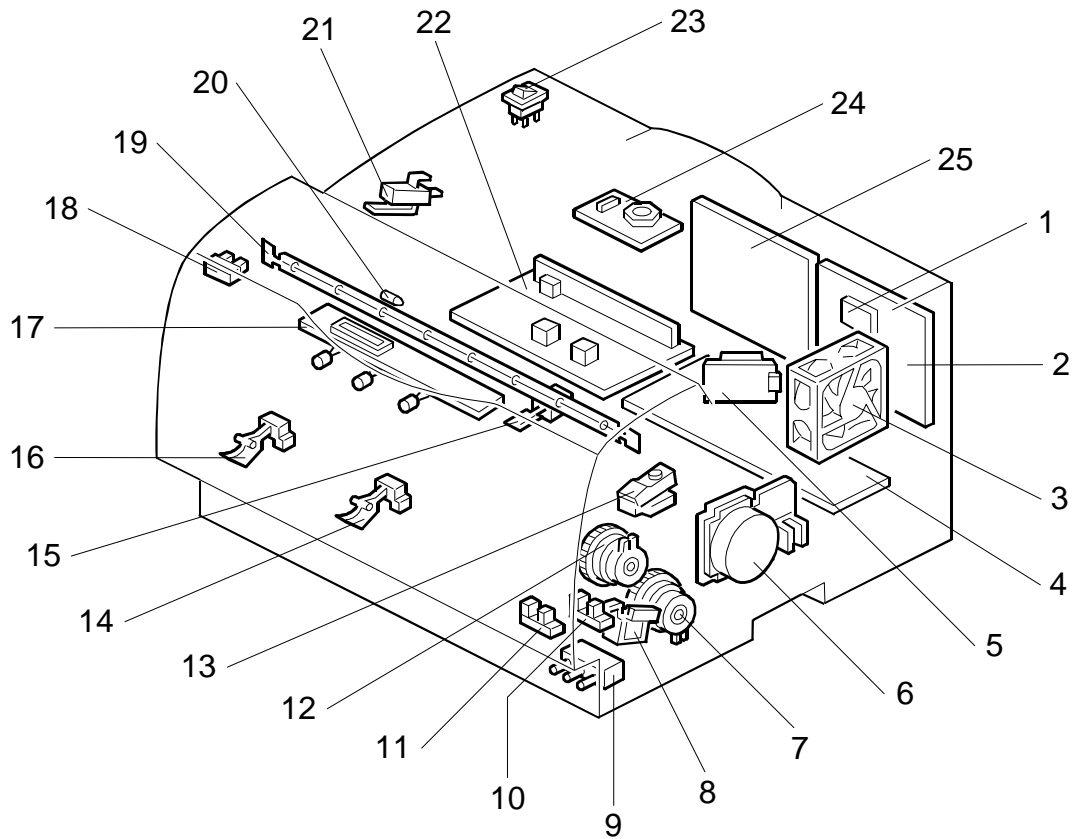
### G032



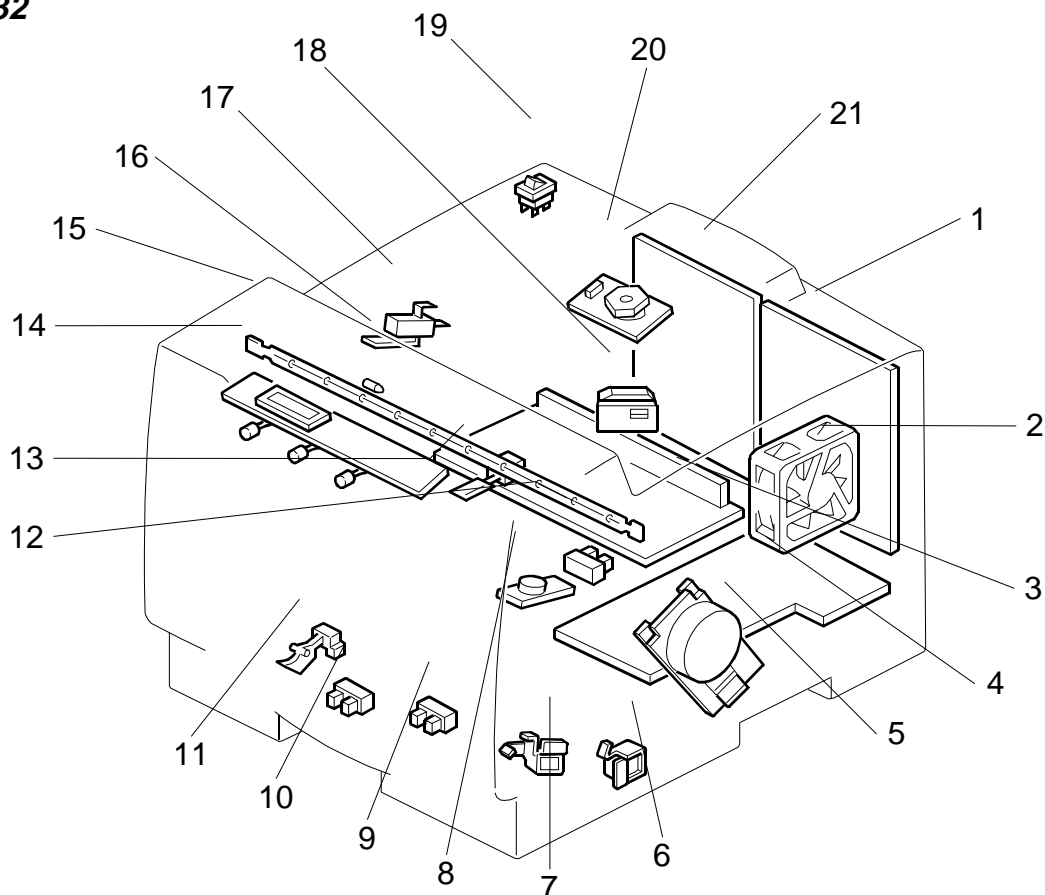
- |   |  |
|---|--|
| 1. Exit Roller  | 9. Toner Cartridge                           |
| 2. Hot Roller   | 10. Paper Tray                               |
| 3. Pressure Roller                                    | 11. Polygonal Mirror Motor                   |
| 4. Transfer Roller                                    | 12. 1st Mirror (G031)<br>F-theta Lens (G032) |
| 5. By-pass Feed Roller                                | 13. Barrel Toroidal Lens (G031)              |
| 6. By-pass Tray                                       | 14. F-theta Mirror (G031)                    |
| 7. Registration Rollers (G031)<br>Relay Roller (G032) | 15. Shield Glass                             |
| 8. Paper Feed Roller                                  |  |

## 1.5 ELECTRICAL COMPONENT LAYOUT

**G031**



- |                                   |                                |
|-----------------------------------|--------------------------------|
| 1. Laser Synchronization Detector | 14. Tray Paper End Sensor      |
| 2. Engine Control Board           | 15. Fusing Thermistor          |
| 3. Exhaust Fan Motor              | 16. Tray Paper Near-end Sensor |
| 4. High Voltage Supply Board      | 17. Control Panel Board        |
| 5. LD Drive Board                 | 18. Fusing Exit Sensor         |
| 6. Main Motor                     | 19. Fusing Lamp                |
| 7. Tray Paper Feed Clutch         | 20. Thermofuse                 |
| 8. By-pass Feed Solenoid          | 21. Front Cover Safety Switch  |
| 9. Tray Paper Size Switch         | 22. Power Supply Unit          |
| 10. Registration Sensor           | 23. Main Switch                |
| 11. By-pass Tray Paper Sensor     | 24. Polygonal Mirror Motor     |
| 12. Registration Clutch           | 25. Printer Control Board      |
| 13. Toner Near-end Sensor         |                                |

**G032**

- |                               |   |
|-------------------------------|---|
| 1. Engine Control Board       | 12. Fusing Exit Sensor                                |
| 2. Exhaust Fan Motor          | 13. Fusing Thermistor                                 |
| 3. Power Supply Unit          | 14. Control Panel Board                               |
| 4. High Voltage Supply Board  | 15. Fusing Lamp                                       |
| 5. Main Motor                 | 16. Thermofuse  |
| 6. Tray Paper Feed Solenoid   | 17. Front Cover Safety Switch                         |
| 7. By-pass Feed Solenoid      | 18. LD Drive Board<br>(with synchronization detector) |
| 8. Toner Near-end Sensor      | 19. Main Switch                                       |
| 9. Registration Sensor        | 20. Polygonal Mirror Motor                            |
| 10. By-pass Tray Paper Sensor | 21. Printer Control Board                             |
| 11. Tray Paper End Sensor     |   |

## 1.6 ELECTRICAL COMPONENT DESCRIPTIONS

Refer to the electrical component layout and the point-to-point diagram on the waterproof paper in the pocket for the locations of these components.

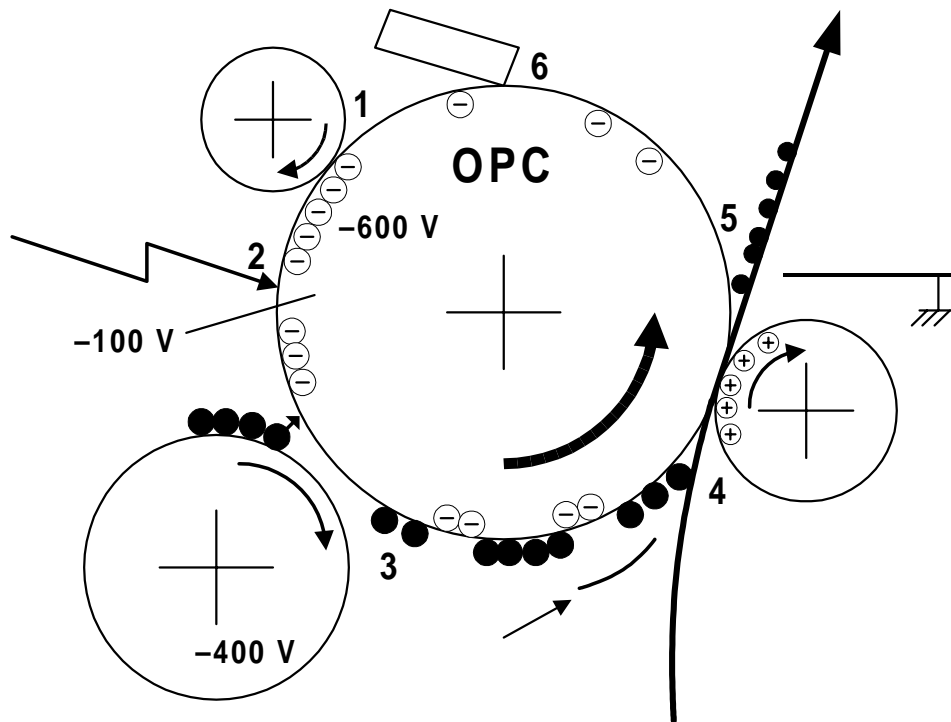
Symbol	Description	Note	Index No.	
			G031	G032
Printed Circuit Boards				
PCB1	High Voltage Supply Board	Supplies high voltage to the drum charge roller, development roller, and transfer roller.	4	4
PCB2	Power Supply Unit (PSU)	Provides dc power to the system and ac power to the fusing lamp.	22	3
PCB3	LD Drive Board	Controls the laser diode.	5	18
PCB4	Control Panel	Controls the display panel, LED, and the touch key pad.	17	14
PCB5	Engine Control Board (ECB)	Controls all base engine functions either directly or through other control boards.	2	1
PCB6	Printer Control Board	Controls the PC interface, print image processing, operation panel, and other controller options.	25	21
Motors				
M1	Main	Drives the main body components.	6	5
M2	Polygonal Mirror	Turns the polygonal mirror.	24	20
M3	Exhaust Fan	Removes heat from the printer.	3	2
Sensors				
S1	Fusing Exit	Detects misfeeds.	18	12
S2	Tray Paper End	Informs the CPU when the paper tray runs out of paper.	14	11
S3	Tray Paper Near-end (G031)	Informs the CPU when the amount of paper in the tray becomes low (50±30 sheets).	16	—
S4	By-pass Tray Paper	Informs the CPU when there is paper on the by-pass tray.	11	10
S5	Registration	Detects the leading edge of the paper to determine when to stop the paper feed clutch, and detects misfeeds.	10	9
S6	Toner Near-end	Detects when toner is low.	13	8
Switches				
SW1	Main	Supplies power to the machine.	23	19
SW2	Front Cover Safety	Cuts the +5VLD and +24 V dc power lines and detects whether the front cover is open or not.	21	17
SW3	Tray Paper Size (G031)	Determines the size of paper in the paper tray, based on the dial setting.	9	—

CÓPIA NÃO CONTROLADA  
ELECTRICAL COMPONENT DESCRIPTIONS

Symbol	Description	Note	Index No.	
			G031	G032
Magnetic Clutches				
MC1	Tray Paper Feed (G031)	Starts paper feed from the paper tray.	7	—
MC2	Registration (G031)	Drives the registration rollers.	12	—
Solenoids				
SOL1	By-pass Feed	Starts paper feed from the by-pass tray.	8	7
SOL2	Tray Paper Feed (G032)	Starts paper feed from the paper tray.	—	6
Lamps				
L1	Fusing	Heats the hot roller.	19	15
Thermistors				
TH1	Fusing	Monitors the temperature of the hot roller.	15	13
Thermofuses				
TF1	Fusing	Provides back-up overhear protection in the fusing unit.	20	16
Others				
LSD1	Laser Synchronization Detector (G031)	Detects the laser beam at the start of the main scan.	1	—

Overall Information

## 1.7 PRINTING PROCESS



G031/4 use an all-in-one type of toner cartridge that includes the drum, toner, development roller, charge roller and other components.

### 1. DRUM CHARGE

In the dark, the charge roller gives a negative charge of -600 volts to the organic photo-conductive (OPC) drum. The charge remains on the surface of the drum because the OPC layer has a high electrical resistance in the dark.

### 2. LASER EXPOSURE

The processed print image data from the engine control board (ECB) is transferred to the drum by a laser beam, which forms an electrical latent image on the drum surface. The areas exposed by the laser beam drop to about -100 volts.

### 3. DEVELOPMENT

The magnetic development brush on the development roller approaches the latent image on the drum. The development roller gives a negative bias of -400 volts to the toner. Toner particles jump and electrostatically attach to the areas of the drum surface where the laser reduced the negative charge on the drum.

**4. IMAGE TRANSFER**

Paper is fed to the area between the drum surface and the transfer roller at the proper time for aligning the print paper and the developed image on the drum surface. Then, the transfer roller applies a positive current to the reverse side of the paper (the size of the current depends on the resolution and the paper size). This pulls the toner particles from the drum surface to the paper. At the same time, the paper is attracted to the transfer roller.

**5. PAPER SEPARATION**

Paper separates from the drum as a result of the electrostatic attraction between the paper and the transfer roller. The discharge plate helps separate the paper from the drum.

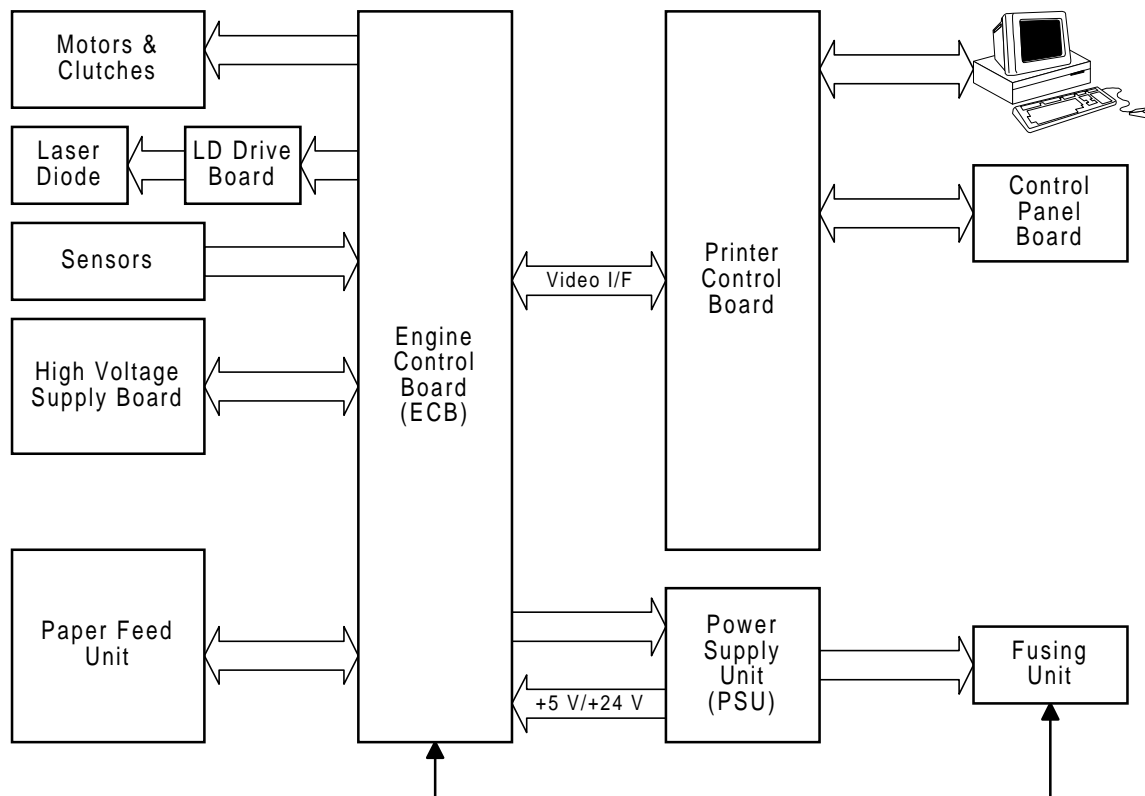
**6. CLEANING**

The cleaning blade removes any toner remaining on the drum surface after the image is transferred to the paper.

**7. QUENCHING**

There is no quenching mechanism.

## BOARD STRUCTURE

**1.8 BOARD STRUCTURE****1.8.1 OVERVIEW**

The engine control firmware controls the components connected to the engine control board (ECB). The printer control board controls the control panel board. The printer control board is also connected to the personal computer.



## 1.8.2 MAJOR COMPONENTS

### 1. Engine Control Board (ECB)

This is the printer engine control board. It controls the following functions:

- Engine sequence
- Machine control, printer engine control
- Timing control for peripherals
- Video control
- Drive control for the sensors, motors, solenoids, and high voltage supply board
- PWM control for edge smoothing (PWM is done on the printer control board)

### 2. Printer Control Board

This is the machine's main control board. It controls the following functions:

- IEEE 1284 parallel port
- Edge smoothing and toner saving
- Engine control board
- Control panel board
- Interfacing with the HDD and NIB

### 3. LD Drive Board

This is the laser diode drive circuit board.

### 4. Power Supply Unit (PSU)

Provides dc power to the system and ac power to the fusing lamp.

### 5. High Voltage Supply Board

Supplies high voltage to the drum charge roller, development roller, and transfer roller.

### 6. Fusing Unit

Fuses toner to the paper. The fusing lamp is controlled by the ECB.

### 7. Control Panel Board

Controls the display panel, the LED, and the touch keypad.

## COMPARISON

## 1.9 COMPARISON

	G031	G032	V20
Standard Paper Tray	250 sheets	250 sheets	250 sheets
Standard Bypass Tray	100 sheets	100 sheets	100 sheets
Optional Paper Tray	500 sheets x 2	500 sheets	500 sheets x 2 + 1,500 sheets
Envelope Feeder	10 envelopes	5 envelopes	100 envelopes
Output Paper Capacity	250 sheets		Standard Output Tray: 400 sheets External Tray: 100 sheets
Input Paper Size (Std./Opt. Tray)	A3/11" x 17" ~ A5 (LEF)	A4 ~ A5 (LEF)	A3/11" x 17" ~ A5/5.5" x 8.5" (LEF)
Input Paper Size (By-pass Tray)	A3/11" x 17" ~ B6 (SEF) free: 11.69" x 17" ~ 3.88" x 5.83"	A4/LG ~ B6 (SEF) free: 8.5" x 14" ~ 3.88" x 5.83"	A3/11"x17" ~ A5/5.5" x 8.5" (SEF)
First Print Speed	5.5 s or less (A4/LT ~ LEF, Standard Tray)	6.5 s or less (A4/LT ~ SEF, Standard Tray)	
Duplex Printing	N/A		Option
Memory (Std./Max. with Opt.)	8 MB/40 MB	8 MB/40 MB	8 MB/68 MB
HDD (Option)	1.6 GB		
Fonts	PCL6 (35 Intellifonts, 10 True Type fonts and 1 bitmap font) PS2 (35 Adobe type 1 fonts)		PCL5e (35 Intellifont, 10 True Type font and 1 bitmap font) PS2 (35 Adobe type 1 fonts)
Interface	Bi-directional parallel x 1 Ethernet (100 Base-Tx/10 Base-T for TCP/IP, IPX/SPX, Ether Talk) RS232C (Optional)		Bi-directional parallel (Standard) Ethernet (10 Base 2/T for IPX/SPX, TCP/IP, Apple Talk) Token Ring (4 Mbps, 16 Mbps for IPS/SPX, TCP/IP, Apple Talk)
Warm-up Time	Less than 39 seconds: 23°C (73°F)		Less than 60 seconds: 23°C (73°F)
Utilities	Aficio Manager		
Dimensions (mm: W x D x H)	450 x 420 x 270 mm (with Std. Tray adjusted for A4) 450 x 555 x 270 mm (with Std. Tray adjusted for A3)	360 x 420 x 270 mm (with Std. Tray adjusted for A4)	530 x 625 x 472 mm (with by-pass tray closed, without the optional paper tray unit, without options)
Weight	Less than 15 kg (33 lb.)	Less than 12 kg (27 lb.)	Less than 44.5 kg (99 lb.)
Consumable Yield	Toner Cartridge: 14 K	Toner Cartridge: 8 K	
PM Kit	Maintenance Kit: 80 K	Maintenance Kit: 60 K	
Technology	Laser beam scanning & electrophotographic printing Monocomponent development		Laser beam scanning & electrophotographic printing Dualcomponent development
Resolution	True 1,200 x 1,200 dpi (PCL6/PS) 600 x 600 dpi (PCL6/PCL5e/PS) 300 x 300 dpi (PCL5e/PS)		600 dpi, 400 dpi (available when the PostScript option is installed), 300 dpi (simulated by doubling pixel width and height at 600 dpi resolution)
Continuous Print Speed	20 ppm (A4 SEF)	14 ppm (A4 LEF)	25 ppm (A4/LT LEF)
Power Consumption	Max. 795 W	Max. 600 W	Max. 950 W
Drivers	PCL6/5e version : Windows 3.1x, 95(98), Windows NT 4.0 PS PPD: Windows 95 (98), Windows NT 4.0, Macintosh OS 7.5 or later		PCL version : Windows 3.1xx, 95, Windows NT 3.51/4.0 (PCL & PS version: Macintosh)
Halftoning	○	○	○
Electrical Sorting	○	○	○
Diagnostic Test Mode	○	○	○
Test Print	○	○	○
Hex Dump List	○	○	○ (N/A from Driver)
Smoothing	○	○	○
Rotated Sorting	N/A	N/A	N/A
Toner Saving Mode	○	○	○
PDL Auto Change	○	○	○
Overlays (PCL)	○	○	N/A
Auto Cassette Change	○	○	○
Energy Saver	○	○	○

# DETAILED DESCRIPTIONS

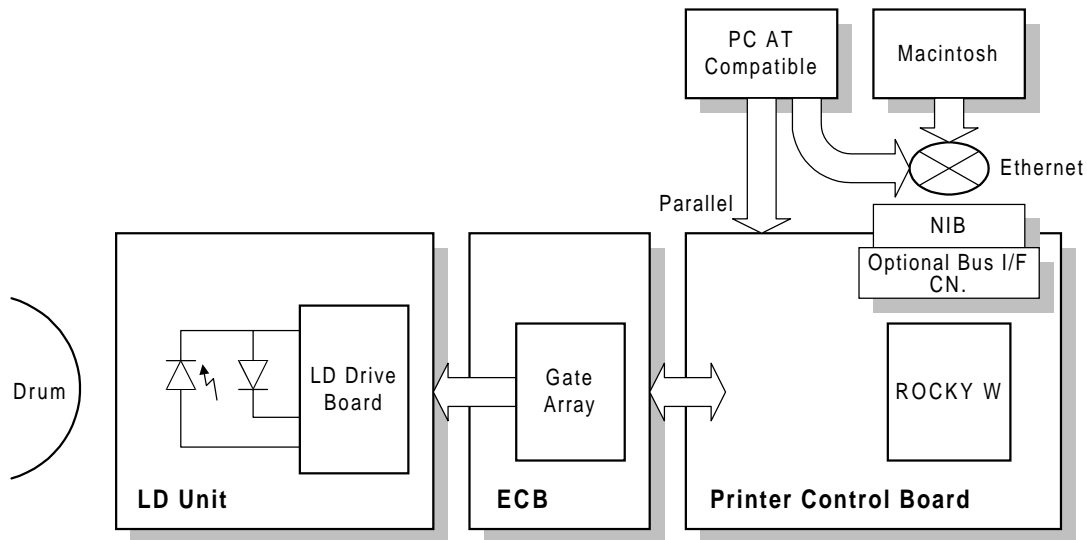
CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

## 2. DETAILED SECTION DESCRIPTIONS

### 2.1 PRINTING

#### 2.1.1 IMAGE DATA PATH



The printer control board receives the print data from the host computer (AT compatible Windows PC or Macintosh).

- For the G031, the printer control board has two OBI (Optional Bus Interface) connectors to connect a network interface board (NIB), RS232C interface, or HDD unit.
- For the G032, the printer control board has one OBI connector.

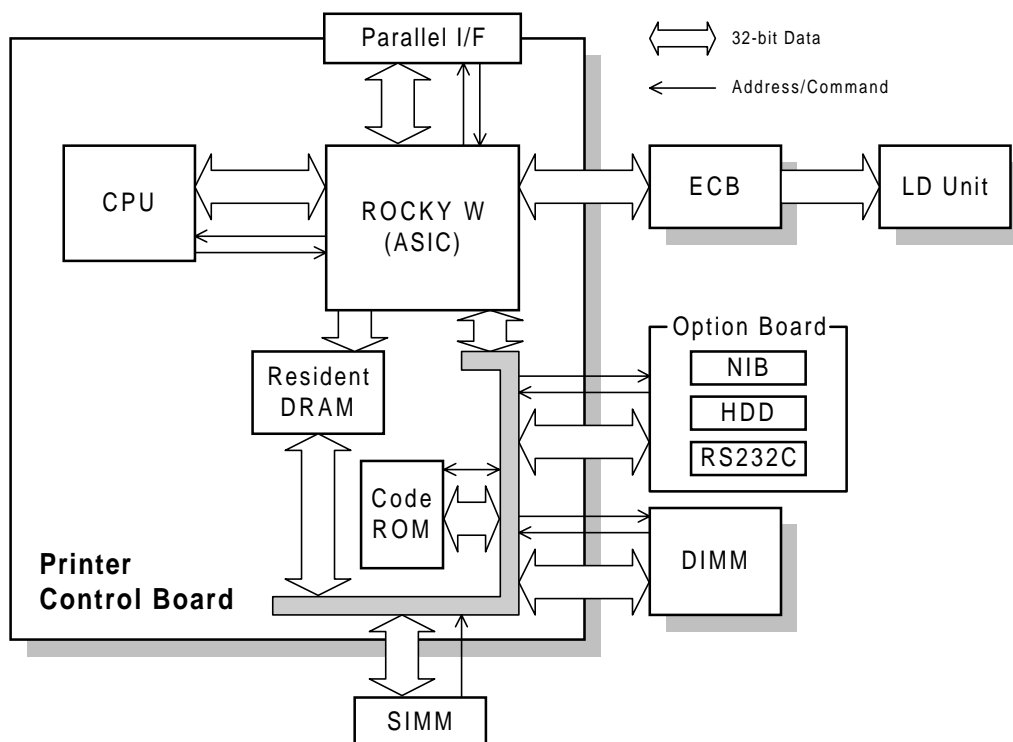
The printer control board generates the print image data and sends it with commands to the ECB (Engine Control Board).

The printer control board contains the image processing ASIC (ROCKY W). The ROCKY W ASIC controls the image processing, IEEE1284 interface, DRAM, edge smoothing, and toner saving. (ASIC: Application Specific Integrated Circuit)

The ECB contains a gate array. The gate array controls LD print timing control and the serial interface to the printer control board.

Finally, the ECB sends the video data to the LD drive board.

## PRINTING

**2.1.2 PRINTER CONTROL BOARD**

The printer control board receives the print data from the computer through the parallel cable or network interface board.

The printer control board contains the CPU (which is a 64-bit RISC processor), the ROCKY W ASIC, 8 MB of resident DRAM for main memory, and a 8 MB code ROM.

A SIMM card can be installed for extra DRAM memory and a DIMM card can be connected for service purposes (firmware upgrade).

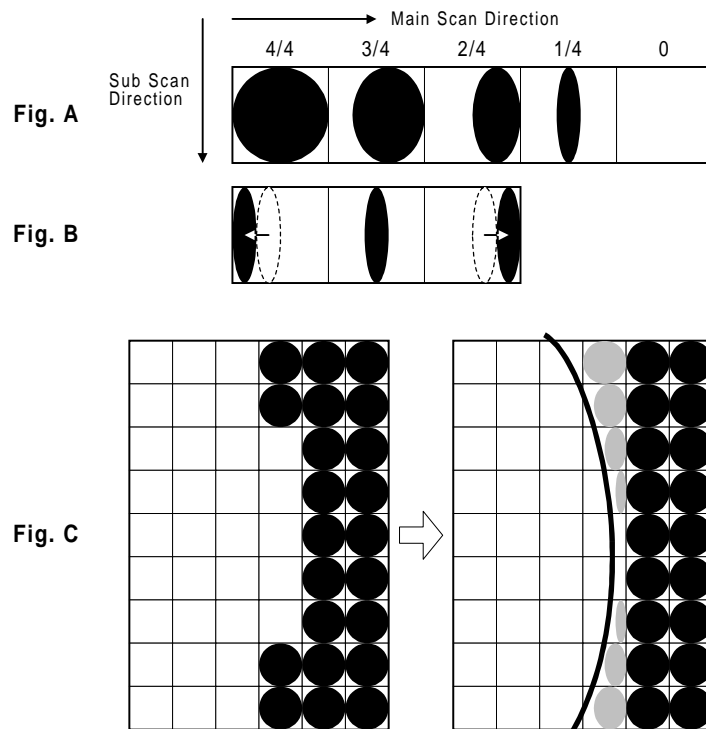
The control board controls the following to produce the print image data.

- 1) IEEE1284 parallel port interface
- 2) Control panel
- 3) Edge smoothing and toner saving
- 4) Engine control board
- 5) Interfacing with the HDD, NIB, and RS232C board.

### 2.1.3 IMAGE DATA PROCESSING

Edge smoothing and toner saving are performed by an ASIC (ROCKY W). The edge smoothing and toner saving modes can be switched on/off with the machine's control panel or the printer driver.

#### *Edge Smoothing*



Jagged edges on characters as shown in the above illustration are reduced using edge smoothing. Edge smoothing changes the laser pulse duration and position for certain pixels.

Fig. A shows the four possible pulse durations, and Fig. B shows how the laser pulse can be in one of three positions within the pixel. Fig. C shows an example of how edge smoothing is used.

Edge smoothing is not done for 1,200-dpi printing.

#### *Toner Saving Mode*

Toner saving is done by reducing the number of black dots in the printed image. An 8 x 8 matrix filter is used.

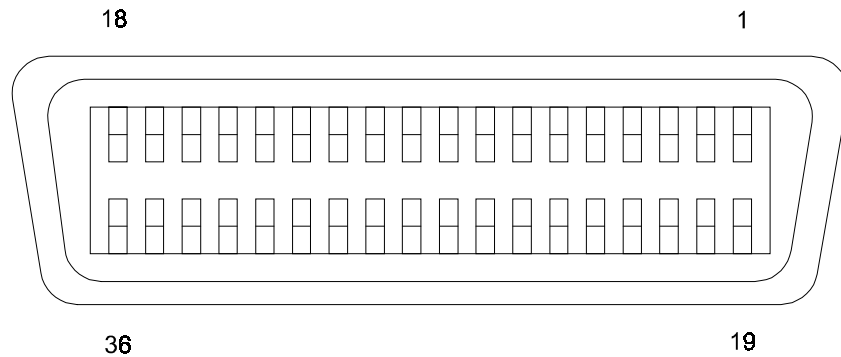
As a result, less toner is used to create the latent image on the drum and black areas print as gray.

The printer driver prevents edge smoothing and toner saving mode from being used at the same time.

PRINTING

## 2.1.4 HOST INTERFACE

### *Bi-directional Parallel Interface*



A 36-pin bi-directional parallel interface connector (female) is used.

The bi-directional parallel interface on the controller works in three modes; Compatible, Nibble and ECP modes. These modes are standardized by IEEE 1284.



## 2.2 LASER EXPOSURE

### 2.2.1 OVERVIEW

This machine uses a laser diode to produce electrostatic images on an OPC drum. The laser diode unit converts image data from the ECB into laser pulses, and the optical components direct these pulses to the drum.

Exposure of the drum by the laser beam creates the latent image. The laser beam makes the main scan while drum rotation controls the sub scan.

	<b>G031</b>	<b>G032</b>
Strength of the beam output	5 mW	5 mW
Strength of the beam on the drum	0.636 mW	0.43 mW
Printing	Binary (2 bits/pixel)	Binary (2 bits/pixel)

There are two polygon motor speeds:

#### - G031 -

<b>Resolution (dpi)</b>	<b>Modes</b>	<b>Motor Speed (rpm)</b>	<b>Data Frequency (MHz)</b>
600	300/600 dpi printing	22478.22	22.0926
1,200	1,200 dpi printing	22478.22	44.1851

#### - G032 -

<b>Resolution (dpi)</b>	<b>Modes</b>	<b>Motor Speed (rpm)</b>	<b>Data Frequency (MHz)</b>
600	300/600 dpi printing	22377.62	15.0528
1,200	1,200 dpi printing	22377.62	30.1056

#### Differences between 1,200 dpi and 600 dpi printing

To produce 1,200 dpi, the machine uses a different data frequency for the main scan and a different line speed for the sub scan, compared with 600 dpi printing.

For 1,200 dpi printing, the polygon motor works at the same speed as for 600 dpi printing but the data frequency is twice as fast as in 600 dpi printing.

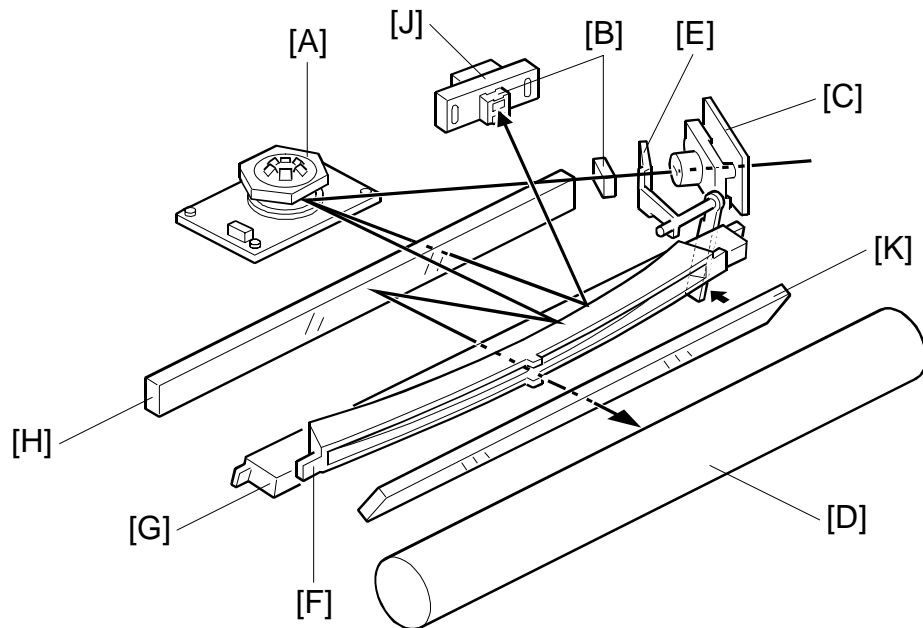
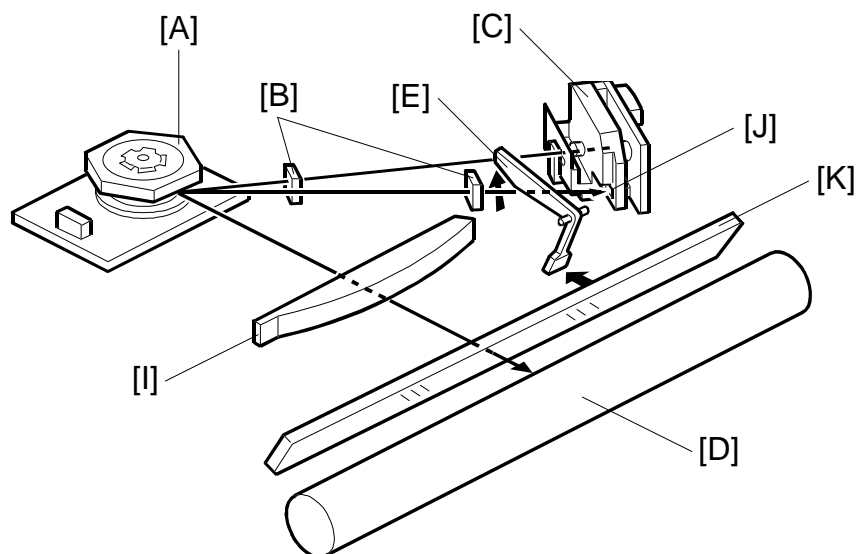
The paper at 1,200 dpi is fed at half the speed used for 600 dpi, as follows.

	<b>600 dpi printing</b>	<b>1,200 dpi printing</b>
Paper feed line speed	92 mm/s	46 mm/s

The beam diameter for 1,200 dpi printing is the same as for 600 dpi printing.

## LASER EXPOSURE

## 2.2.2 OPTICAL PATH

**G031****G032**

[A]: Polygonal Mirror  
 [B]: Cylindrical Lenses  
 [C]: LD Drive Board  
 [D]: Drum  
 [E]: LD Shutter  
 [F]: F-Theta Mirror

[G]: BTL (Barrel Toroidal Lens)  
 [H]: 1st Mirror  
 [I]: F-theta Lens  
 [J]: Laser Synchronization Detector  
 [K]: Shield Glass

The optical path from the laser diode to the drum is shown on the previous page.

The LD drive board [C] outputs the laser beam to the polygonal mirror [A] through the cylindrical lenses [B], which focus the laser beam.

### ***G031***

The laser beam goes to the F-theta mirror [F], 1st mirror [H] and BTL [G]. Then, the beam reaches the drum [D] through the shield glass [K].

The beam reflected by the polygonal mirror writes the pixels of the latent image on the drum. The F-theta mirror [F] ensures constant intervals between the pixels. The BTL [G] corrects for irregularities in the polygonal mirror faces.

The laser synchronization detector [J] synchronizes the start of the main scan.

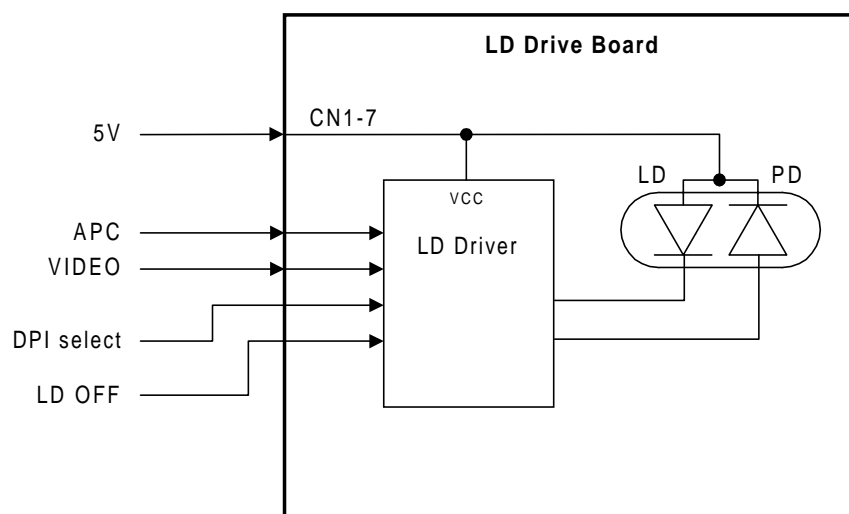
### ***G032***

The G032 has a shorter beam path than the G031.

The beam which is reflected by the polygonal mirror goes to the F-theta lens [I]. The beam reaches the drum [D] through the shield glass [K]. The F-theta lens [I] does the functions of both the F-theta [F] mirror and the BTL [G].

The LD drive board for the G032 contains the laser synchronization detector.

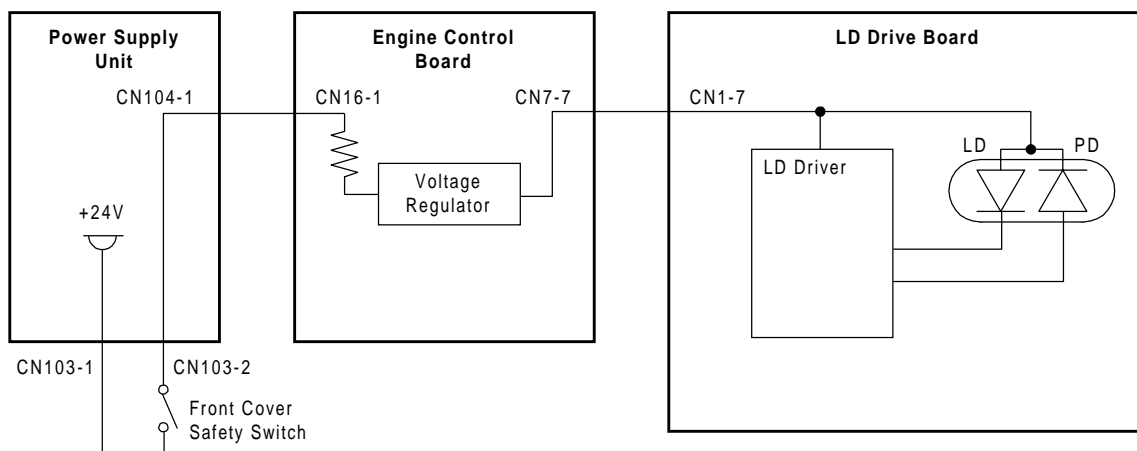
## LASER EXPOSURE

**2.2.3 AUTO POWER CONTROL (APC)**

To prevent the intensity of the laser beam from changing because of temperature, the machine monitors the laser beam with a photodiode (PD). The PD is enclosed in the laser diode. The PD passes an electrical current to the LD driver IC and this IC adjusts its output level to keep the laser diode output constant.

The laser diode power level is adjusted on the production line. Do not touch the variable resistors on the LD unit in the field.

## 2.2.4 LD SAFETY SWITCH



Detailed  
Descriptions

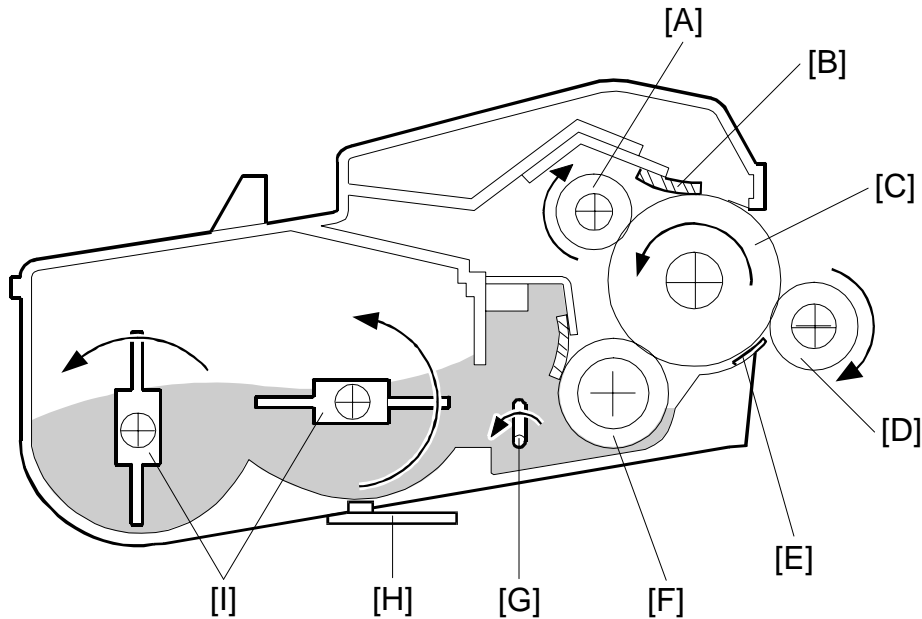
### ***Front Cover Safety Switch***

To ensure that the laser beam does not inadvertently switch on during servicing, there is a safety switch located at the front cover. The switch is on the LD 24 V line.

### ***Mechanical Laser Shutter***

When the toner cartridge is removed, the laser shutter is released and this interrupts the laser beam.

## TONER CARTRIDGE

**2.3 TONER CARTRIDGE****2.3.1 OVERVIEW**

The toner cartridge consists of the components shown above. The toner cartridge contains the OPC drum and the toner cassette, and includes the mechanisms for drum charge, development, and cleaning. The drum is 30 mm in diameter.

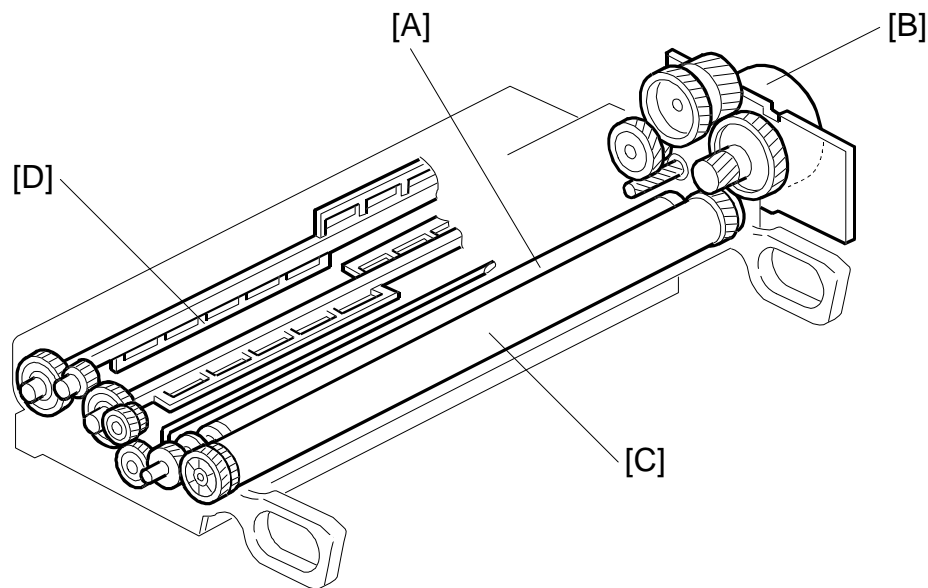
[A]: Charge Roller  
 [B]: Cleaning Blade  
 [C]: OPC Drum  
 [D]: Transfer Roller  
 [E]: Transfer Blade

[F]: Development Roller  
 [G]: Mixing Blade  
 [H]: Toner Near-end Sensor  
 [I]: Agitator

The main motor drives the rollers in the toner cartridge. The charge roller [A] charges the drum [C]. Monocomponent toner is used. The cleaning blade [B] cleans the drum surface.

The toner near end sensor is mounted within the print engine, under the toner cartridge. The toner near end sensor can be seen with the toner cartridge removed.

### 2.3.2 DRIVE



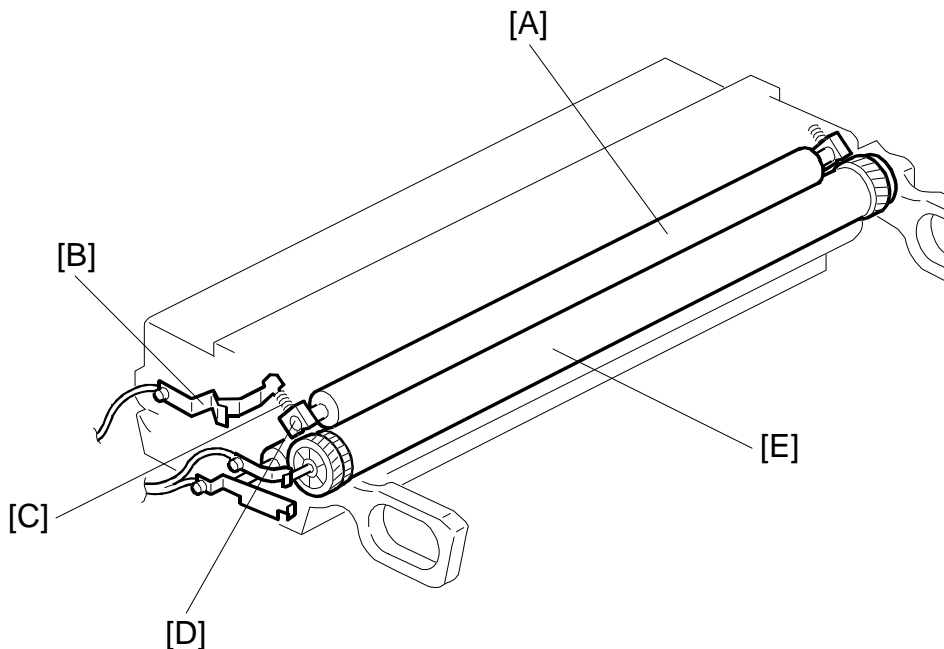
Detailed  
Descriptions

The main motor [B] drives the drum [C], the development roller [A], and agitators [D] through a series of gears. The main motor speed is controlled by the engine control board (ECB).

When a new cartridge is installed, the machine clears the near-end condition if the toner near-end sensor detects that there is sufficient toner.

There is no counter for the toner cartridge.

## TONER CARTRIDGE

**2.3.3 DRUM CHARGE**

This machine uses a drum charge roller system instead of a scorotron corona wire system to charge the drum. The drum charge roller [A] always contacts the surface of the drum [E] because of the charge roller pressure springs [C], and gives a negative charge to the drum surface. While the drum is rotating, the drum charge roller also turns because of friction between the roller and the drum.

The drum charge roller system generates less ozone than a scorotron corona wire charge system. Due to this, there is no ozone filter in the machine.

The high voltage supply board gives a negative dc voltage to the drum charge roller through the charge roller terminal [B], charge roller pressure spring [C], and the charge roller bushing [D]. This gives the drum surface a negative charge of - 600 V.

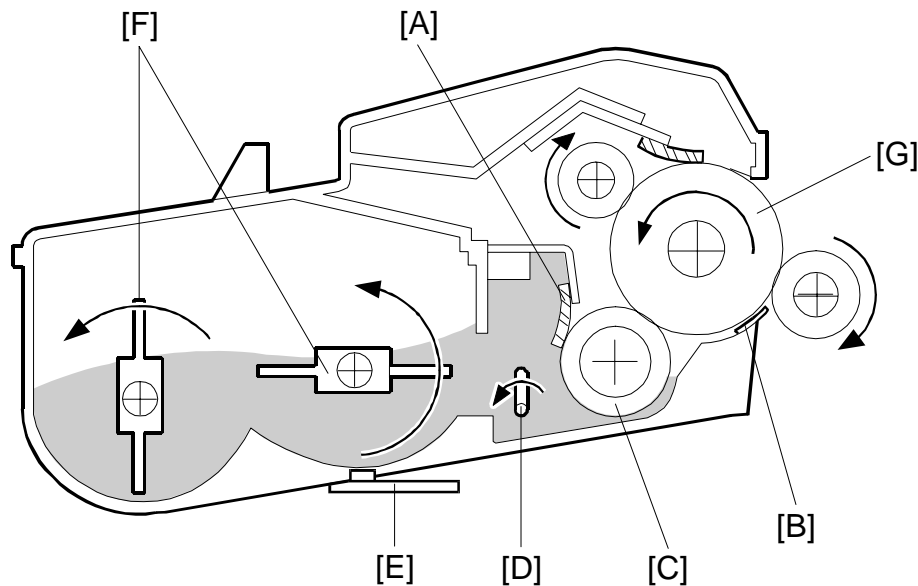
The high voltage supply board also applies 2 kVp-p 1 kHz ac to the charge roller. This ac removes any remaining voltage on the drum.

The toner cartridge has no cleaning pad, temperature control, or contact mechanism for the drum charge roller. The material of the drum charge roller allows a simple mechanism. The drum charge roller is part of the toner cartridge, so when the toner runs out, the drum charge roller is changed at the same time. This happens before the drum charge roller gets dirty.



### 2.3.4 DEVELOPMENT

#### Overview



Detailed  
Descriptions

This machine uses monocomponent toner. The G031 has two agitators [F] in the toner cartridge (shown above). The G032 has one agitator.

The agitator(s) [F] and the mixing blade [D] mix the toner in the toner cartridge and transport it to the development roller [C]. Friction between the transported toner and the doctor blade [A] gives the toner a negative charge.

Internal permanent magnets in the development roller attract the toner to the development roller sleeve. The doctor blade trims the toner to the desired thickness on the development roller sleeve. The development roller does not contact the drum [G]. There is a small gap between the toner on the surface of the development roller sleeve and the drum. Toner jumps across this gap to develop the latent image.

The development bias consists of ac and dc components. The ac component improves the transfer of toner.

The transfer blade [B] is charged to the same voltage as the development bias. This helps to keep the toner on the drum.

The toner near-end sensor [E] is located under the toner cartridge. The sensor monitors the toner concentration through the plastic housing of the toner cartridge.

## TONER CARTRIDGE

### ***Toner Near-End Sensor***

The toner near-end sensor monitors the toner concentration by checking the magnetic field strength.

When the reading goes down to a threshold value, the machine enters the near-end condition. There is no toner end condition (the user replaces the cartridge when the print quality has become unacceptable). The threshold value cannot be changed.

No adjustment is required after the sensor is replaced.

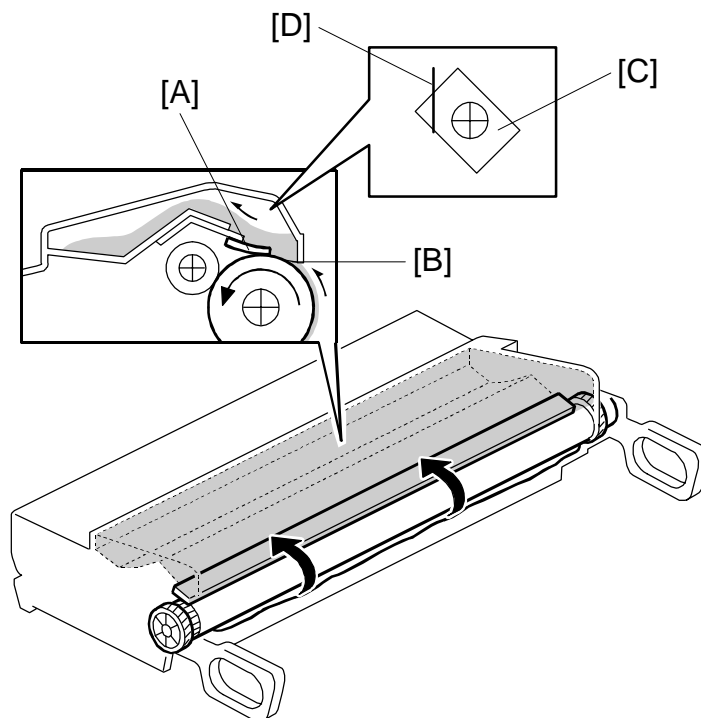
### ***Toner Supply***

The toner in the toner cartridge is mixed by the agitator(s) and mixing blade. The toner near-end sensor is not used to control toner supply. When the machine is turned on or the front cover is closed, the agitator(s) and the mixing blade rotate to mix the toner for a brief period.

### ***Development Bias***

The high voltage supply unit gives the development roller a charge of  $-400\text{ V dc}$  and an ac component of  $1.8\text{ kVp-p}$ .  $1.8\text{ kHz ac}$  is also used. To prevent toner from transferring to non-image areas on the drum, the development bias is different for image areas and non-image areas.

### 2.3.5 DRUM CLEANING



Detailed  
Descriptions

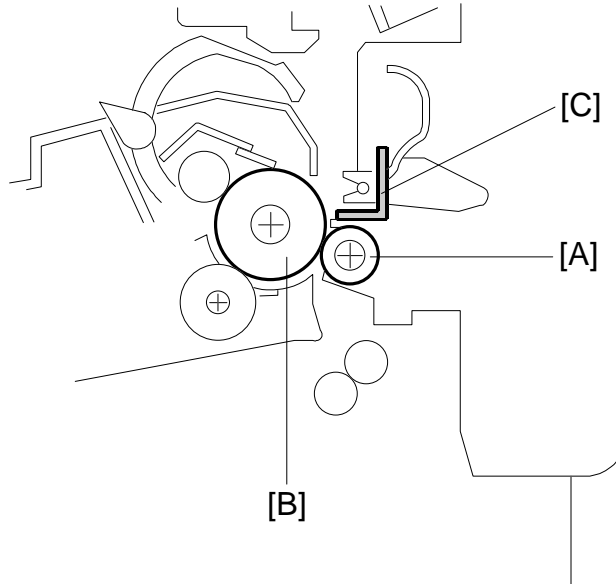
The cleaning blade [A] removes any toner remaining on the drum after the image is transferred to the paper. The toner remaining on the drum is scraped off by the cleaning blade and transferred to the collection area. The mylar sheet [B] prevents the toner from dropping out of the cleaning unit.

The toner cartridge in the commercial toner cartridge has a toner collection coil [C] and scraper [D]. These improve the collection of waste toner.

There is no toner recycling mechanism.

## 2.4 IMAGE TRANSFER AND PAPER SEPARATION

### 2.4.1 OVERVIEW



The machine uses a transfer roller [A] which touches the surface of the drum [B].

The high voltage supply unit supplies a positive current to the transfer roller. A feedback circuit inside the machine automatically keeps the transfer current constant.

The transfer current depends on the paper size. For A3/11" x 17" paper in the G031, 7 $\mu$ A is supplied, and for A4/LT paper in the G032, 6 $\mu$ A is supplied (for 600 dpi resolution in both of these cases).

The transfer roller attracts the toner from the drum onto the paper.

Drive from the drum through a gear drives the transfer roller.

The discharge plate [C] and the curvature of the drum helps the paper to separate from the drum. The discharge plate is connected to ground.

## 2.4.2 TRANSFER ROLLER CLEANING

If the paper size is smaller than the printed image, or if a paper jam occurs during printing, toner may be transferred to the roller surface. To prevent this toner from transferring to the back side of the printouts, the transfer roller has to be cleaned before the next printing run.

During transfer roller cleaning, the high voltage supply unit supplies a negative cleaning bias to the transfer roller. The negatively charged toner on the transfer roller is then transferred back to the drum. Then a positive cleaning bias is applied to the transfer roller to push back to the drum any toner which was positively charged by the transfer roller.

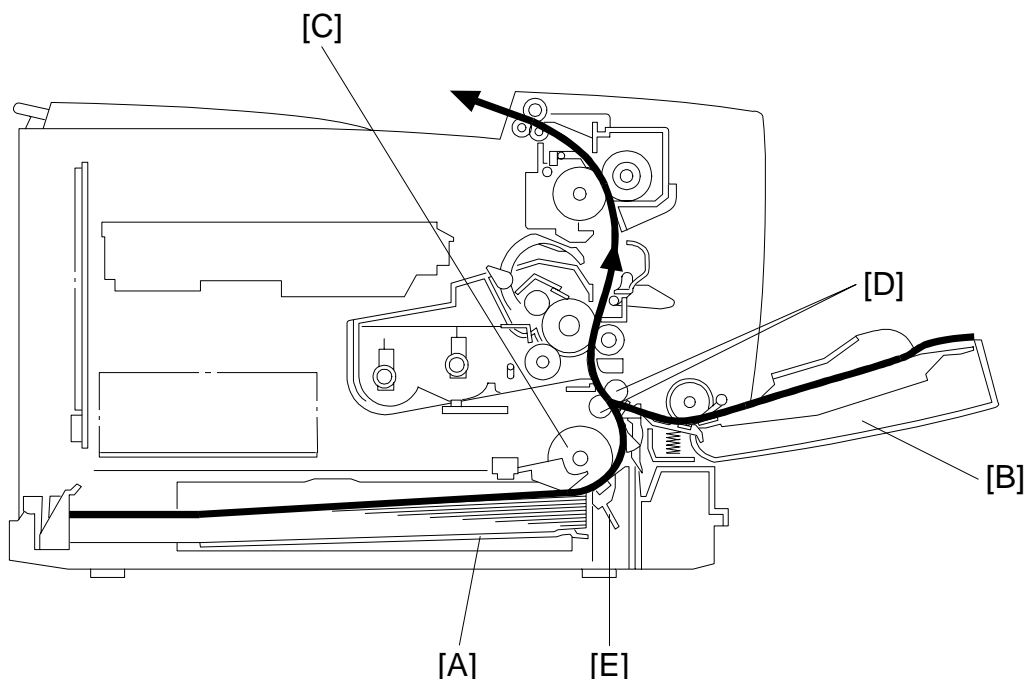
The machine goes through the cleaning mode in the following conditions:

- After a printer jam has been cleared.
- Just after the power is switched on.
- After 10 sheets of paper have been printed and the print job has finished.

## PAPER FEED

## 2.5 PAPER FEED

### 2.5.1 OVERVIEW

**G031**

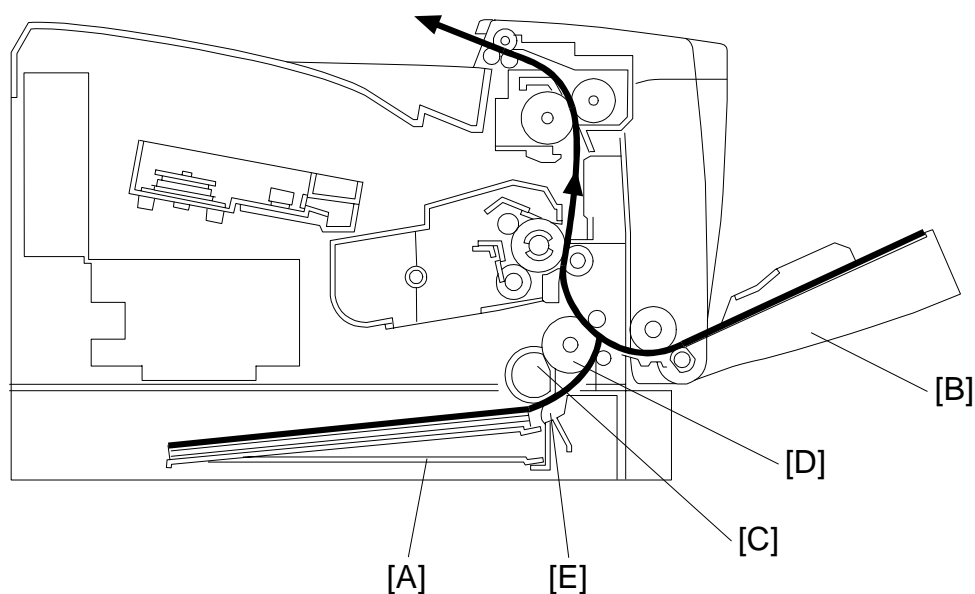
There is a paper tray [A] and a by-pass tray [B].

The paper tray holds 250 sheets. The by-pass tray can hold 100 sheets of paper. The paper feed roller [C] drives the top sheet of paper from the paper tray to the registration rollers [D].

The paper tray has a friction pad [E] which allows only one sheet to feed at a time.

When the paper tray is closed after the paper is loaded, the paper size actuator (behind the paper size indicator, which is located at the front right of the tray) pushes the tray paper size switch. This informs the CPU what paper size is loaded in the tray and that the tray is in place.

The tray can be extended manually to hold paper longer than A4/Letter size.

**G032**Detailed  
Descriptions

There is a paper tray [A] and a by-pass tray [B].

The paper tray holds 250 sheets. The by-pass tray can hold 100 sheets of paper. The paper feed roller [C] drives the top sheet of paper from the paper tray to the relay roller [D]. Then the relay roller feeds the paper to the registration area.

The paper tray has a friction pad [E] which allows only one sheet to feed at a time.

This machine does not have a paper size switch. So, before printing, the user must register the paper size in the paper tray at the printer's operation panel.

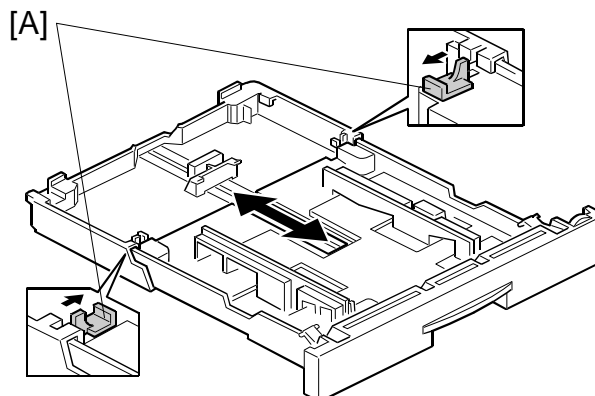
The built-in tray can only hold A4 or letter size paper.

## PAPER FEED

**2.5.2 PAPER TRAY****G031*****Tray Extension***

The tray can be extended manually to hold paper longer than A4/Letter size. The default setting of the tray length is for short paper. To use longer paper, release the catches [A] at both sides, then extend the tray and re-lock the catches.

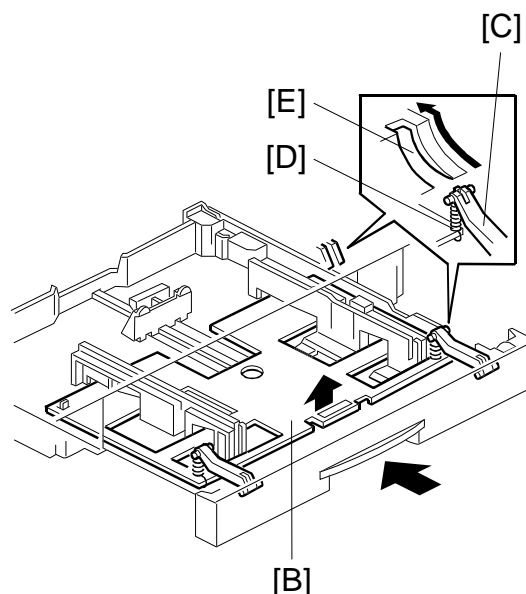
The paper sizes in the table given below can be used.



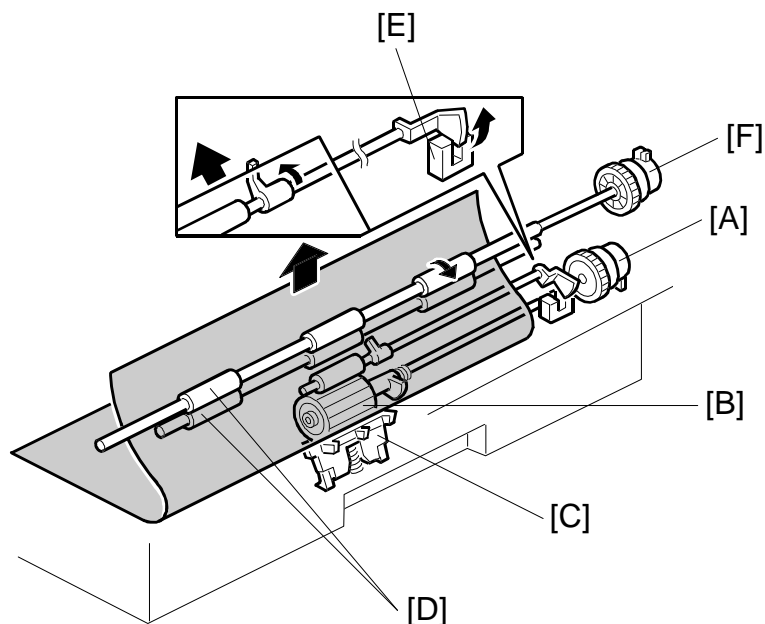
Tray mode	Possible Paper Sizes
Short (default)	A5 Landscape, B5 Landscape, A4 Landscape, 7 1/4" x 10 1/2" Landscape, 8 1/2" x 11" Landscape, 8 1/2" x 11" Portrait, A4 Portrait
Long	8 1/2" x 13" Portrait, 8" x 13" Portrait, 8 1/4" x 13" Portrait, 8 1/2" x 14" Portrait, B4 Portrait, A3 Portrait, 11" x 17" Portrait

***Bottom Plate Lift***

The tray bottom plate [B] is connected to the cassette arms [C] by springs [D]. When the cassette is put in the machine, the slopes of the guide blocks [E] on the machine lift the cassette arms up and the springs keep the stack of paper at the correct height. When the paper is used up, the springs pull the tray bottom plate up as shown in the picture.





*Paper Feed Drive*Detailed  
Descriptions

The main motor drives the pick-up and feed mechanism. The tray paper feed clutch [A] transfers drive from the main motor to the paper feed roller [B].

This machine uses a feed roller and friction pad mechanism. The friction pad [C] only allows the top sheet to feed. Therefore, during paper feed, the top sheet of paper is separated from the stack and fed to the registration rollers [D].

When the paper actuates the registration sensor [E], the tray paper feed clutch turns off. When the paper reaches a certain position, the registration clutch [F] turns on to transfer drive from the main motor to the registration rollers. Then the registration rollers feed the paper to the transfer area.

## PAPER FEED

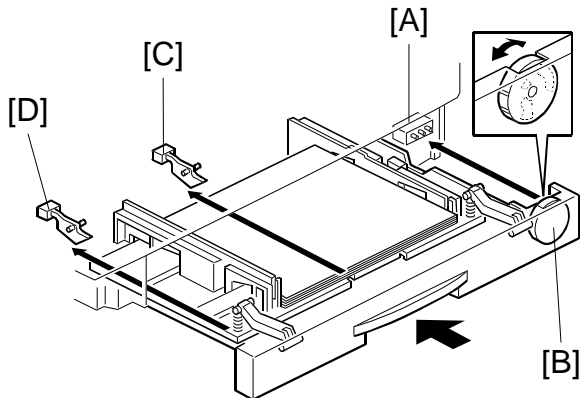
***Paper Size Detection***

The paper size switch [A] includes three sensors (microswitches). The sensors are actuated by actuators on a dial [B] behind the paper size indicator plate.

Each paper size has its own actuator, with a unique combination of notches. To determine the paper size, the CPU reads which switches have been turned off by the actuator.

The CPU disables paper feed from a tray if the paper size cannot be detected. If the paper size actuator is broken, or if there is no tray installed, the printer control board recognizes that the paper tray is not installed.

When the paper size actuator is at the "\*" mark, the paper tray can be set up to accommodate one of a wider range of paper sizes by using a user tool at the machine's operation panel.



Models		Switch Location		
North America	Europe	Left	Center	Right
8 1/2" x 14" Portrait	A5 Landscape	On	On	On
A4 Landscape	A4 Landscape	On	Off	Off
8 1/2" x 11" Portrait	A4 Portrait	On	On	Off
*	*	Off	On	On
8 1/2" x 13" Portrait	8 1/2" x 13" Portrait	Off	On	Off
8 1/2" x 11" Landscape	8 1/2" x 11" Landscape	On	Off	On
11" x 17" Portrait	A3 Portrait	Off	Off	On

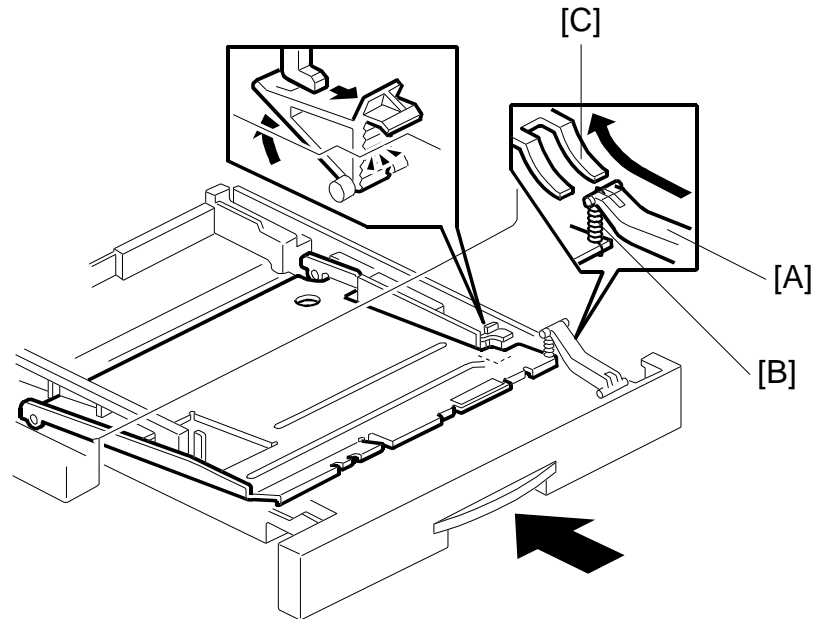
On: Pushed Off: Not Pushed

***Paper End Detection***

When the paper tray runs out of paper, the feeler of the tray paper end sensor drops into the cutout in the tray bottom plate and this activates the paper end sensor [C].

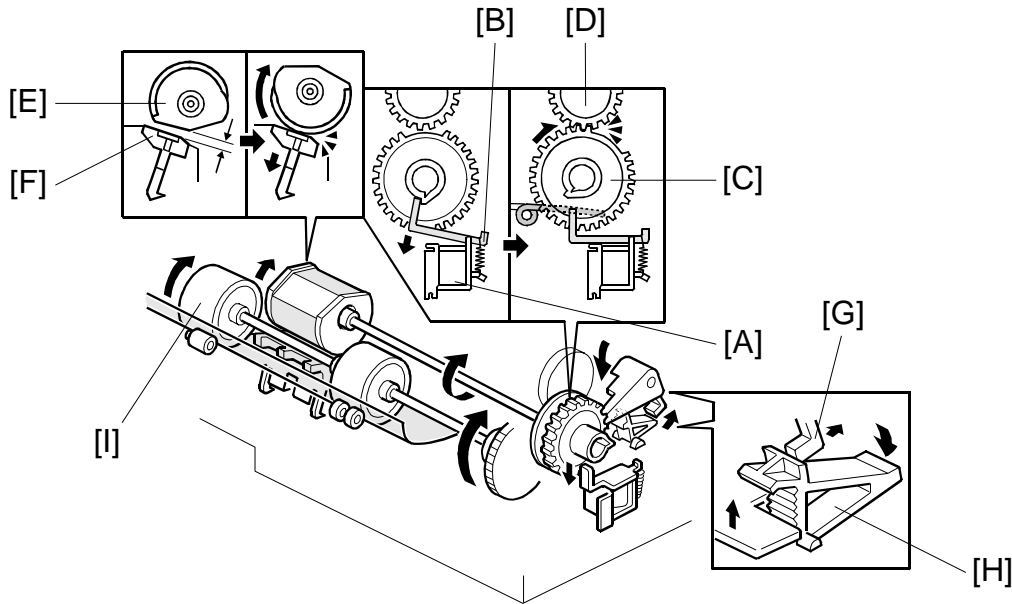
***Paper Near End Detection***

When almost 50 sheets are left on the tray, the tray bottom plate pushes up the feeler of the tray paper near end sensor [D]. However, there is no indication on the printer's operation panel; the signal is only for use by the host computer.

**G032*****Bottom Plate Lift*****Detailed  
Descriptions**

The tray bottom plate is connected to the cassette arm [A] by the spring [B]. When the cassette is put in the machine, the slope of the guide block [C] on the machine lifts the cassette arm up and the spring lifts up the bottom plate.

## PAPER FEED

*Paper Feed Drive*

The main motor drives the pick-up and feed mechanism through the paper pick-up drive gear [D].

To pick up paper, the tray paper feed solenoid [A] turns on and the gear stopper [B] comes off the paper feed roller gear [C]. This gear does not move immediately, because the gap in the teeth prevent it from engaging the drive gear [D]. It is first turned clockwise by a spring until its teeth engage with the drive gear, which now drives the paper feed roller [E].

At the same time, the cam behind the paper feed roller gear moves the stopper release lever [G], and this releases the bottom plate stopper [H]. The bottom plate can then lift the top of the paper stack to the correct height for paper feed.

This machine uses a feed roller and friction pad mechanism. The friction pad [F] only allows the top sheet to feed to the relay roller [I].

After one turn, the paper feed roller gear stops because the part of the gear without teeth is now back at the starting position, opposite the pick-up drive gear. The gear stopper and bottom plate stopper also return to their previous positions.

Then the relay rollers feed the paper to the transfer area.

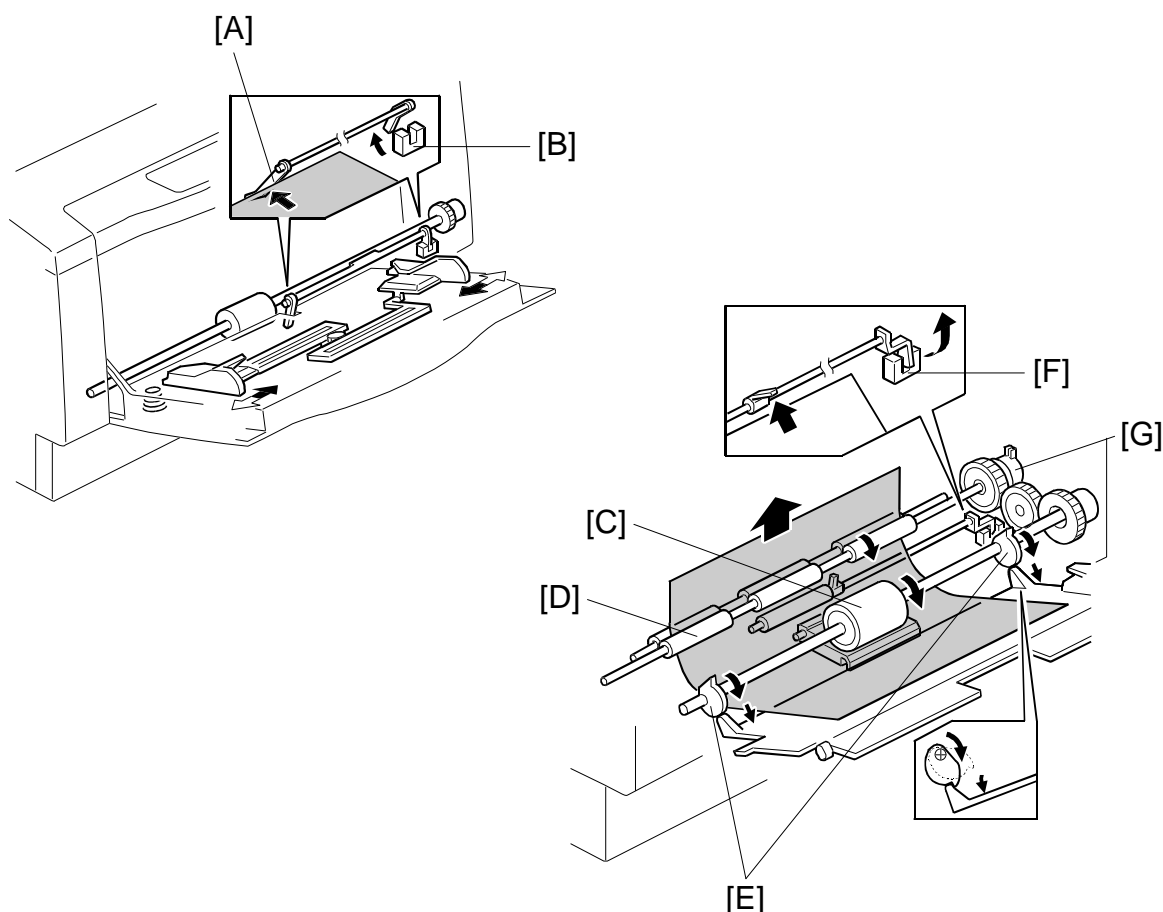
**NOTE:** If the gear stopper comes off the paper feed roller gear as a result of shock or vibration and paper is placed in the tray, the machine starts to feed paper as soon as it is turned on. To fix this problem, remove all paper from the paper tray then turn on the machine.

*Paper End Detection*

This is the same as for the G031. There is no near-end detection.

### 2.5.3 BY-PASS TRAY

**G031**



Detailed  
Descriptions

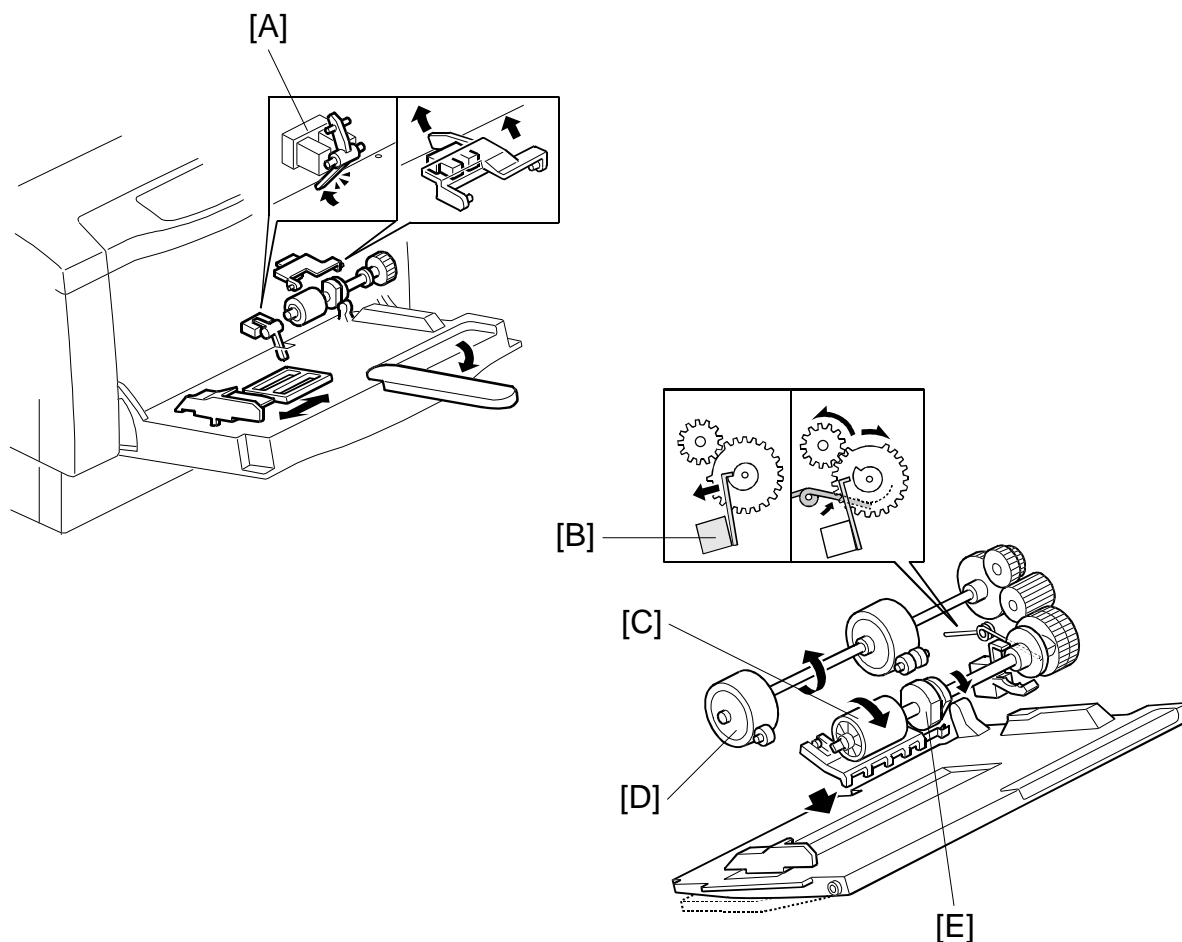
When paper is placed on the tray, the by-pass tray paper feeler [A] is pushed up and the actuator leaves the by-pass tray paper sensor [B].

After image processing in the printer control board, the CPU energizes the by-pass feed solenoid and the by-pass feed roller [C] starts to feed paper to the registration roller [D]. The by-pass feed roller has two cams [E] and these cams release the by-pass tray bottom plate to press the stack of paper against the by-pass feed roller.

This machine uses a feed roller and friction pad mechanism, with drive from the main motor transmitted when the by-pass feed clutch turns on. The friction pad only allows the top sheet to feed to the registration rollers.

When the paper leading edge activates the registration sensor [F], the registration clutch [G] turns on.

## PAPER FEED

**G032**

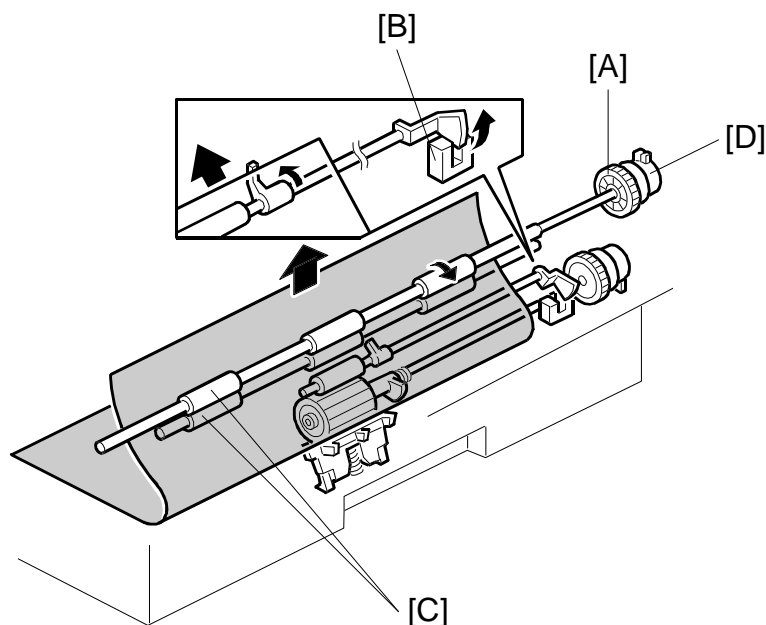
When paper is placed on the tray, the by-pass tray paper sensor [A] activates.

After image processing in the printer control board, the CPU energizes the by-pass feed solenoid [B] and the by-pass feed roller [C] starts to feed paper to the relay roller [D]. The by-pass feed roller cam [E] releases the by-pass tray bottom plate to press the stack of paper against the by-pass feed roller.

This machine uses a feed roller and friction pad mechanism, with drive from the main motor transmitted when the by-pass feed clutch turns on. The friction pad only allows the top sheet to feed to the relay roller.

## 2.5.4 PAPER REGISTRATION

**G031**



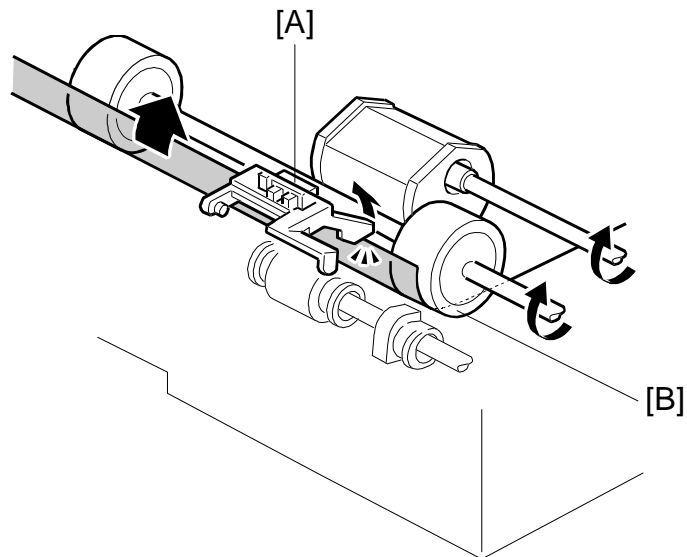
Detailed  
Descriptions

Main motor rotation is transmitted to the registration clutch gear [A].

The registration sensor [B] is just before the registration rollers [C].

When the paper leading edge activates the registration sensor, the registration clutch [D] turns off and the registration rollers stop turning. However, the tray paper feed roller clutch stays on for a bit longer. This delay allows time for the paper to press against the registration rollers and buckle slightly to correct skew. The registration clutch energizes at the proper time to align the paper with the image on the drum. The registration rollers feed the paper to the image transfer section.

The registration sensor is also used for paper misfeed detection.

**G032**

The registration sensor [A] is just after the relay roller [B]. However, this machine has no registration roller.

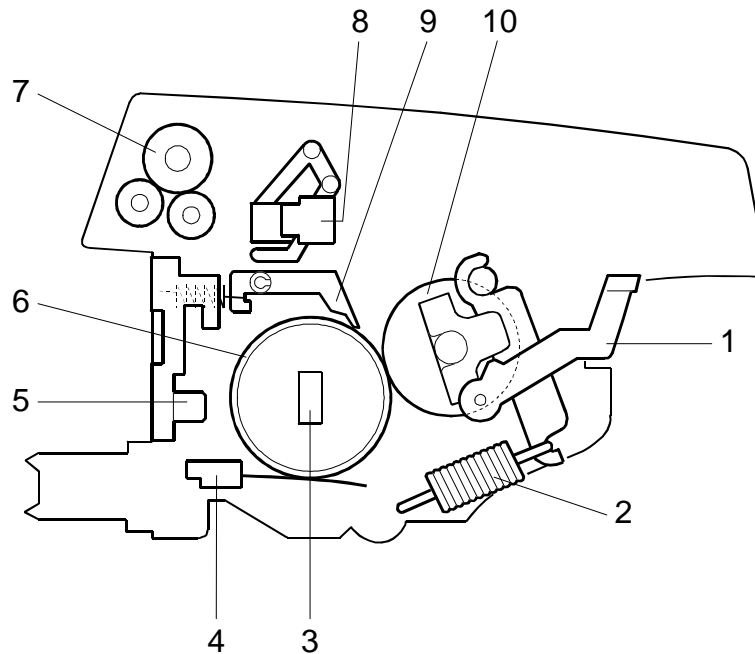
A certain time after the paper leading edge activates the registration sensor, the CPU starts to write the latent image on the drum.

The registration sensor is also used for paper misfeed detection.



## 2.6 IMAGE FUSING

### 2.6.1 OVERVIEW

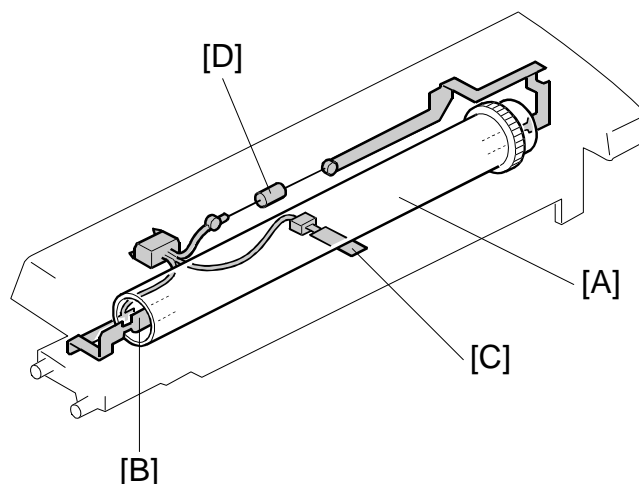


Detailed  
Descriptions

The fusing unit consists of the following parts.

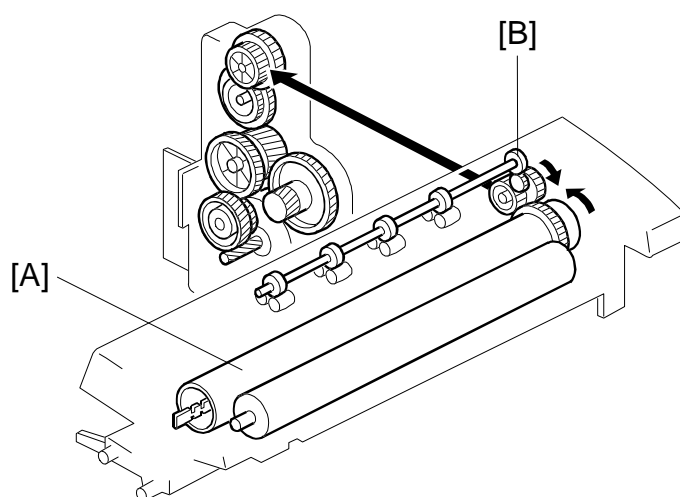
- |   |                         |
|---|-------------------------|
| 1. Pressure Roller Release Lever        | 6. Hot Roller           |
| 2. Pressure Spring                      | 7. Exit Roller          |
| 3. Fusing Lamp                          | 8. Fusing Exit Sensor   |
| 4. Fusing Thermistor                    | 9. Hot Roller Strippers |
| 5. New Fusing Unit Detector (G031 only) | 10. Pressure Roller     |

## IMAGE FUSING

**2.6.2 FUSING**

After the image has been transferred, the paper enters the fusing unit. The image is fused to the paper by applying heat and pressure through the combination of hot roller [A], the fusing lamp [B], and the pressure roller.

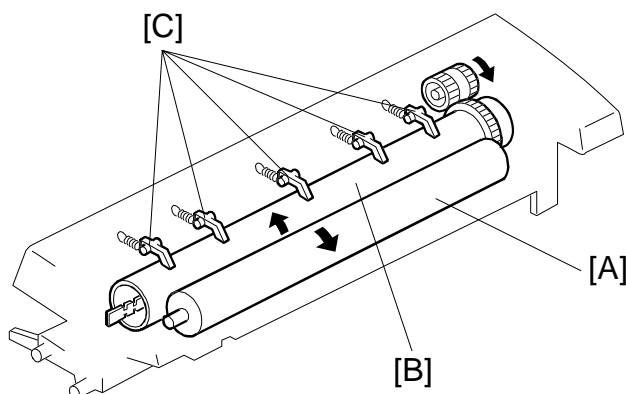
The CPU monitors the hot roller temperature through the fusing thermistor [C] that is in contact with the hot roller surface. The thermofuse [D] protects the fusing unit from overheating.

**2.6.3 FUSING UNIT DRIVE**

The main motor drives the hot roller [A] through a train of gears.

The hot roller drives the exit roller [B] through a gear.

## 2.6.4 PRESSURE ROLLER/PAPER EXIT

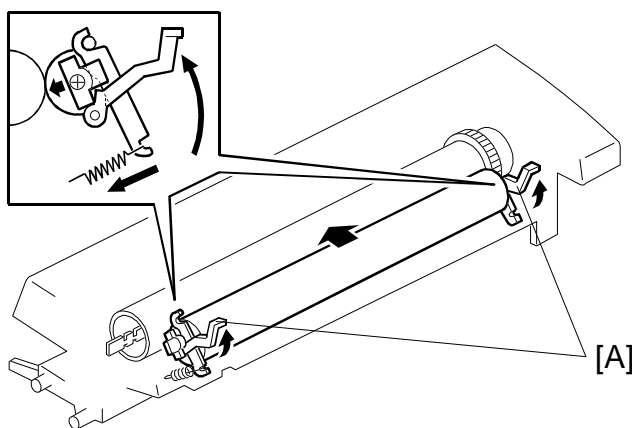


Detailed  
Descriptions

During printing, the pressure roller [A] is pressed against the hot roller [B] by springs.

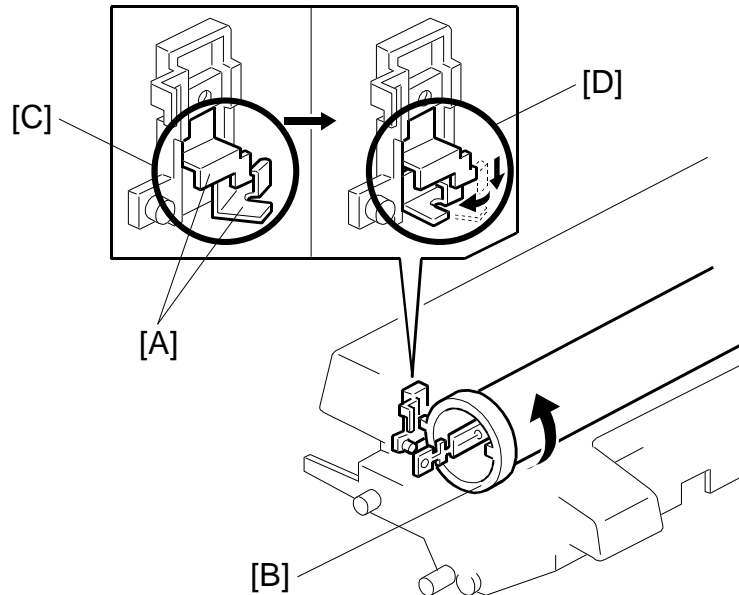
The hot roller strippers [C] separate the paper from the hot roller and direct it to the exit roller. Then the exit roller feeds the paper to the paper tray.

## 2.6.5 FUSING UNIT DRIVE RELEASE



When the pressure roller release levers [A] are pushed down, the pressure roller moves away so that jammed paper can be removed.

### 2.6.6 NEW FUSING UNIT DETECTION (G031 ONLY)

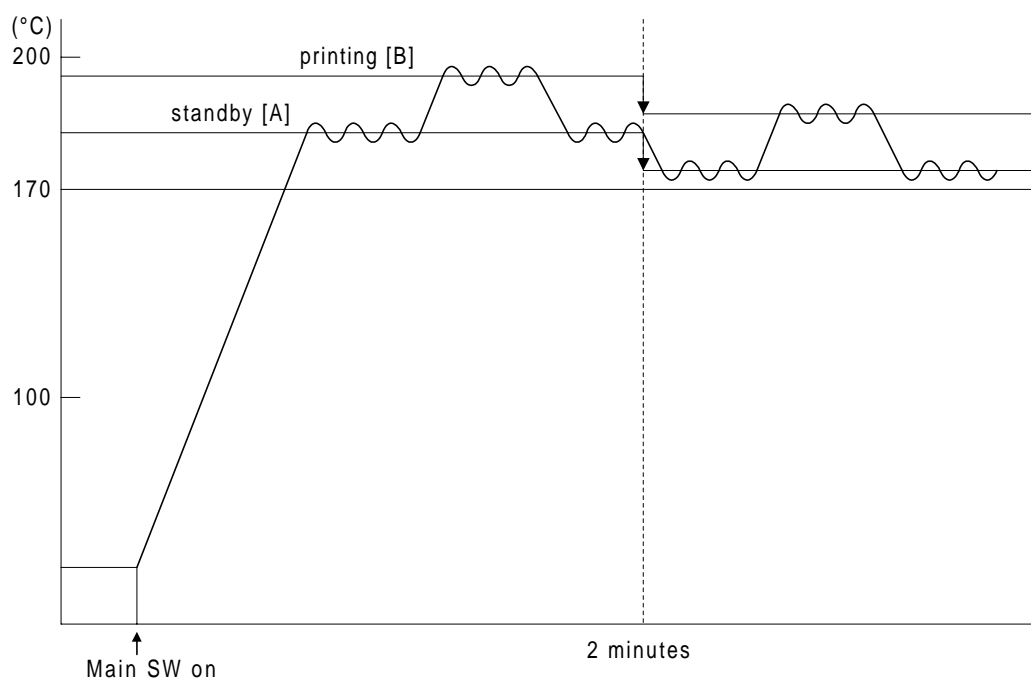


The fusing unit in the G031 maintenance kit has this detection mechanism (the fusing unit obtained as a service part does not). When the fusing unit has been replaced, the CPU detects the new unit and automatically removes the “Replace Maintenance Kit” from the display and resets the maintenance counter.

**NOTE:** The G032 doesn't have this mechanism, so after replacing the fusing unit, clear the “Replace Maintenance Kit” status using the “User Menu – Maintenance – PM Clear” procedure.

There are two terminals [A] at the rear left side of the fusing unit. Before installation, these terminals are in contact [C]. When the machine is turned on after installing the new fusing unit, the projection on the ring [B] attached to the left end of the hot roller disconnects the terminals [D]. When the CPU detects the change in the signal from these terminals from ‘shorted’ to ‘open’, the CPU recognizes that a new fusing unit has been installed and it then resets the counter and the display.

## 2.6.7 FUSING TEMPERATURE CONTROL



Detailed  
Descriptions

When the main switch turns on, the CPU turns on the fusing lamp. When the thermistor detects the 'ready to print' temperature (170°C), the machine can start to print at any time. The lamp stays on until the thermistor detects the standby temperature [A]. Then, the CPU maintains this temperature using on-off control. To start printing, the CPU raises the temperature to the printing temperature [B] and maintains it as shown on the next page.

In energy saver mode, the fusing lamp is off.

## IMAGE FUSING

The CPU controls the temperature as shown in the following tables to keep the fusing lamp at the appropriate temperature for each condition.

**G031**

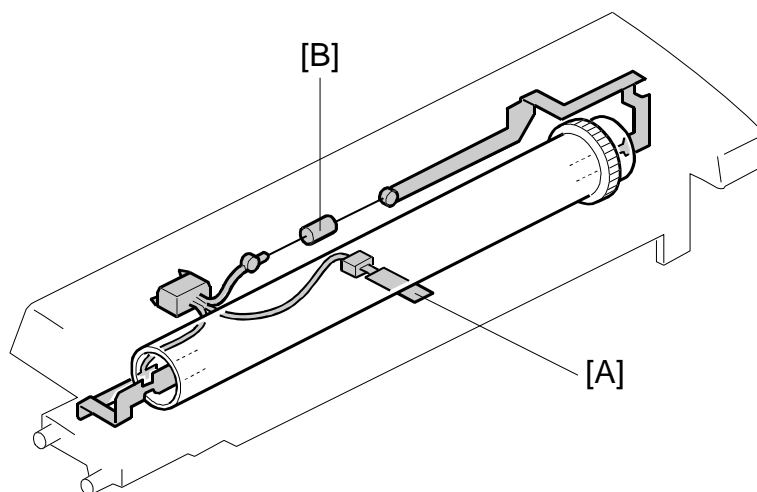
Condition		Power on → Within 2 minutes	After 2 minutes
Ready to print		170°C	170°C
Standby mode		185°C	175°C
Printing (600 dpi)	Normal paper	195°C	185°C
	Thick paper (> 155 g/m <sup>2</sup> , 41 lb)	195°C	195°C
Printing (1,200 dpi)	Normal paper	165°C → 160°C *	160°C → 155°C *
	Thick paper (> 155 g/m <sup>2</sup> , 41 lb)	165°C	160°C

\*: After 26 seconds at 1,200 dpi using normal paper, the temperature is reduced.

**G032**

Condition		Power on → Within 2 minutes	After 2 minutes
Ready to print		170°C	170°C
Standby mode		175°C	165°C
Printing (600 dpi)	Normal paper	185°C	175°C
	Thick paper (> 155 g/m <sup>2</sup> , 41 lb)	185°C	185°C
Printing (1,200 dpi)	Normal paper	150°C → 145°C *	145°C → 140°C *
	Thick paper (> 155 g/m <sup>2</sup> , 41 lb)	150°C	145°C

\*: After 15 seconds at 1,200 dpi using normal paper, the temperature is reduced.



The fusing temperature is controlled using the fusing thermistor [A].

The CPU checks the output from the fusing thermistor once a second. The CPU compares the current and previous temperature, then decides the power-on ratio for the next second. To maintain the target temperature, the CPU controls the fusing lamp power-on ratio as shown in the following table.

Previous minus Current	Current minus Target				
	Over $-3^{\circ}\text{C}$	Within $-3^{\circ}\text{C}$	0	Within $+3^{\circ}\text{C}$	Over $+3^{\circ}\text{C}$
Over $-3^{\circ}\text{C}$	100%	60%	60%	60%	0%
Within $-3^{\circ}\text{C}$	100%	60%	60%	40%	0%
0	100%	60%	60%	40%	0%
Within $+3^{\circ}\text{C}$	100%	60%	60%	40%	0%
Over $+3^{\circ}\text{C}$	100%	60%	0%	0%	0%

Ratio (%): The proportion of time that the fusing lamp power is on

## 2.6.8 OVERHEAT PROTECTION

If the hot roller temperature becomes greater than  $230^{\circ}\text{C}$  for more than 1 second, the CPU cuts off the power to the fusing lamp. At this time, SC543 will be generated.

Even if the thermistor overheat protection fails, there is a thermofuse in series with the common ground line of the fusing lamp. If the temperature of the thermofuse [B] reaches  $169^{\circ}\text{C}$ , the thermofuse opens, removing power from the fusing lamp. At this time, the printer stops operating.

## 2.6.9 ENERGY SAVER MODE

When the machine is not used, the energy saver feature reduces power consumption by switching off the fusing lamp.

### *Entering Energy Saver Mode*

Energy saver mode starts after the machine has been idle for a certain time. This time is specified by the user. The following choices are available.

- Off (energy saver mode never activates)
- 15 minutes
- 30 minutes (default)
- 1 hour
- 2 hours
- 3 hours

This feature is adjusted using the Job Control menu at the printer's operation panel.

**NOTE:** When the machine is in energy saver mode, the CPU turns off the fusing lamp. Therefore, the time from the print start command to the start of printing is longer than in normal standby mode.

### *Leaving Energy Saver Mode*

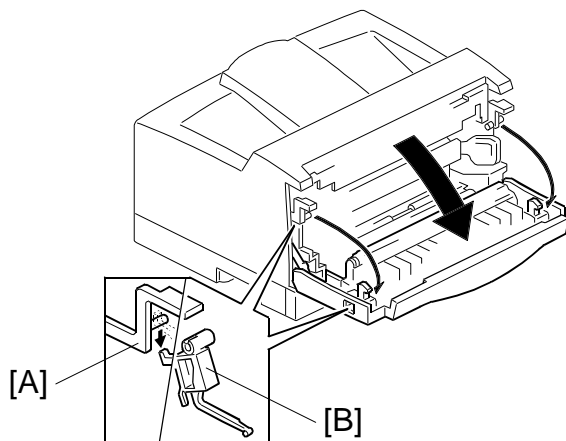
The machine leaves energy saver mode when one of the following happens.

- Print command received from the PC
- Front cover opened and closed
- Paper tray pulled out and replaced
- Any operation panel keys pressed



## 2.7 COVER OPEN DETECTION

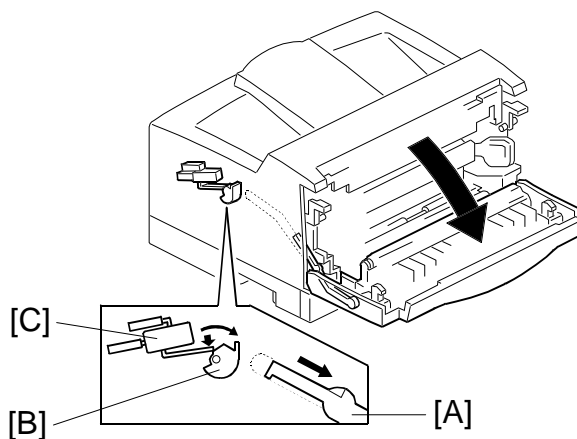
### 2.7.1 FRONT COVER LOCK



There is a hook [A] at the front and rear of the machine. When the front cover is closed, the hooks catch the lock levers [B].

To open the front cover, push the cover open levers at both sides of the front cover.

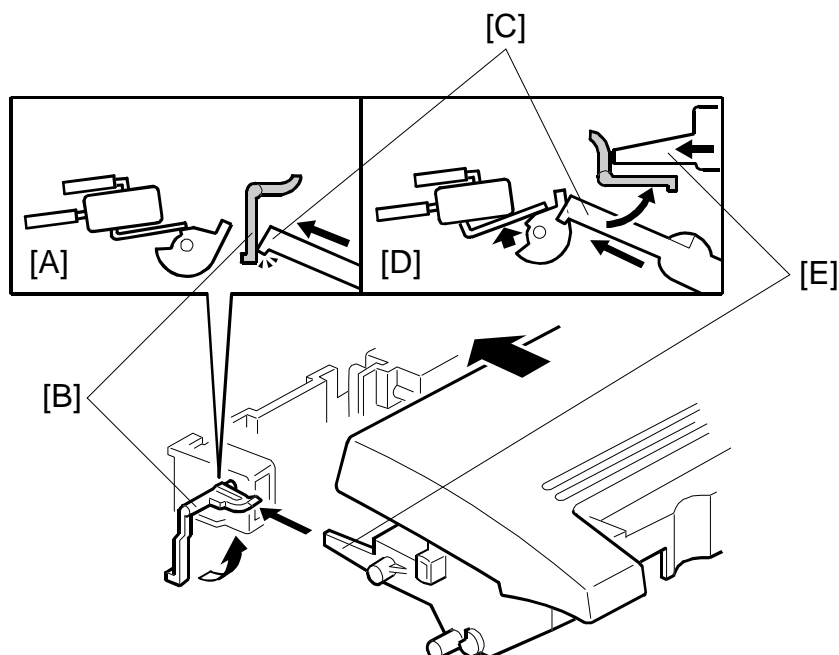
### 2.7.2 FRONT COVER SAFETY SWITCH



When the user opens the front cover, the safety switch release lever [A] moves and the safety switch release cam [B] rotates as shown in the picture. Then the front cover safety switch [C] turns off.

If the front cover safety switch turns off, the +24V line from PSU to ECB is cut. As a result, the power for the LD driver is cut.

### 2.7.3 REMOVING THE FUSING UNIT

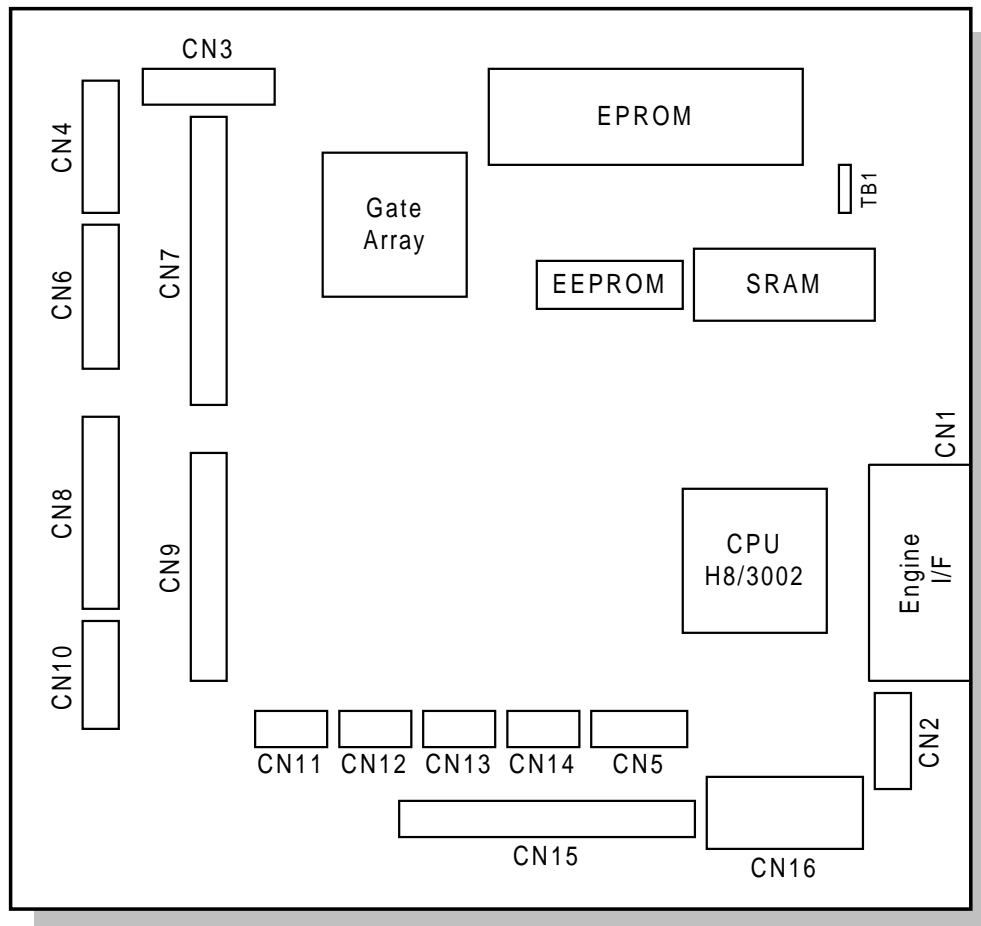


When the fusing unit is not in the machine [A], the stopper [B] blocks the safety switch release lever [C]. Therefore, the front cover cannot be closed.

When the fusing unit is installed properly [D], the projection on the fusing unit [E] lifts up the stopper. Therefore, the safety switch release lever can pass and the front cover can be closed.

## 2.8 ENGINE CONTROL BOARD

### 2.8.1 PCB LAYOUT



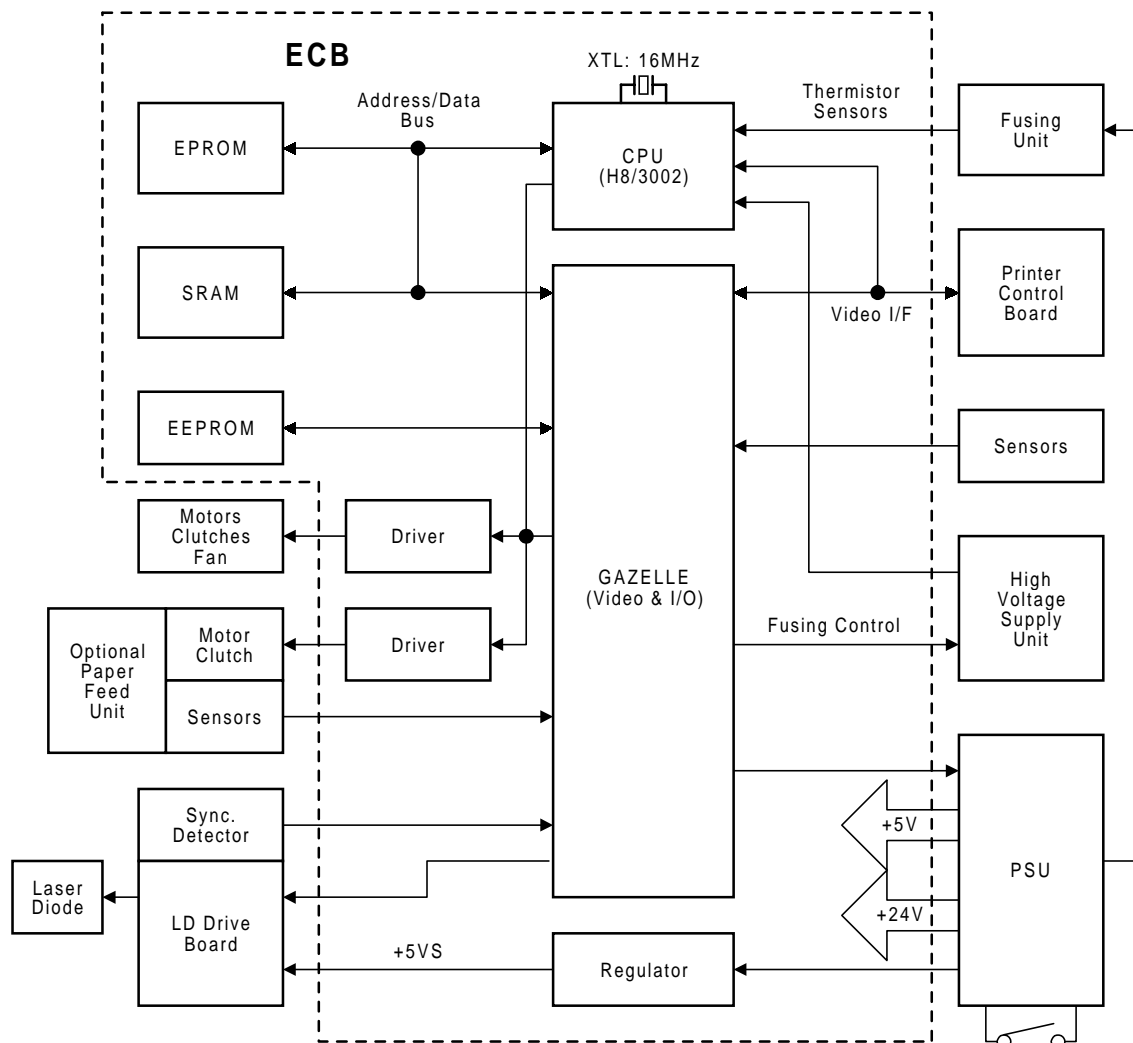
Detailed  
Descriptions

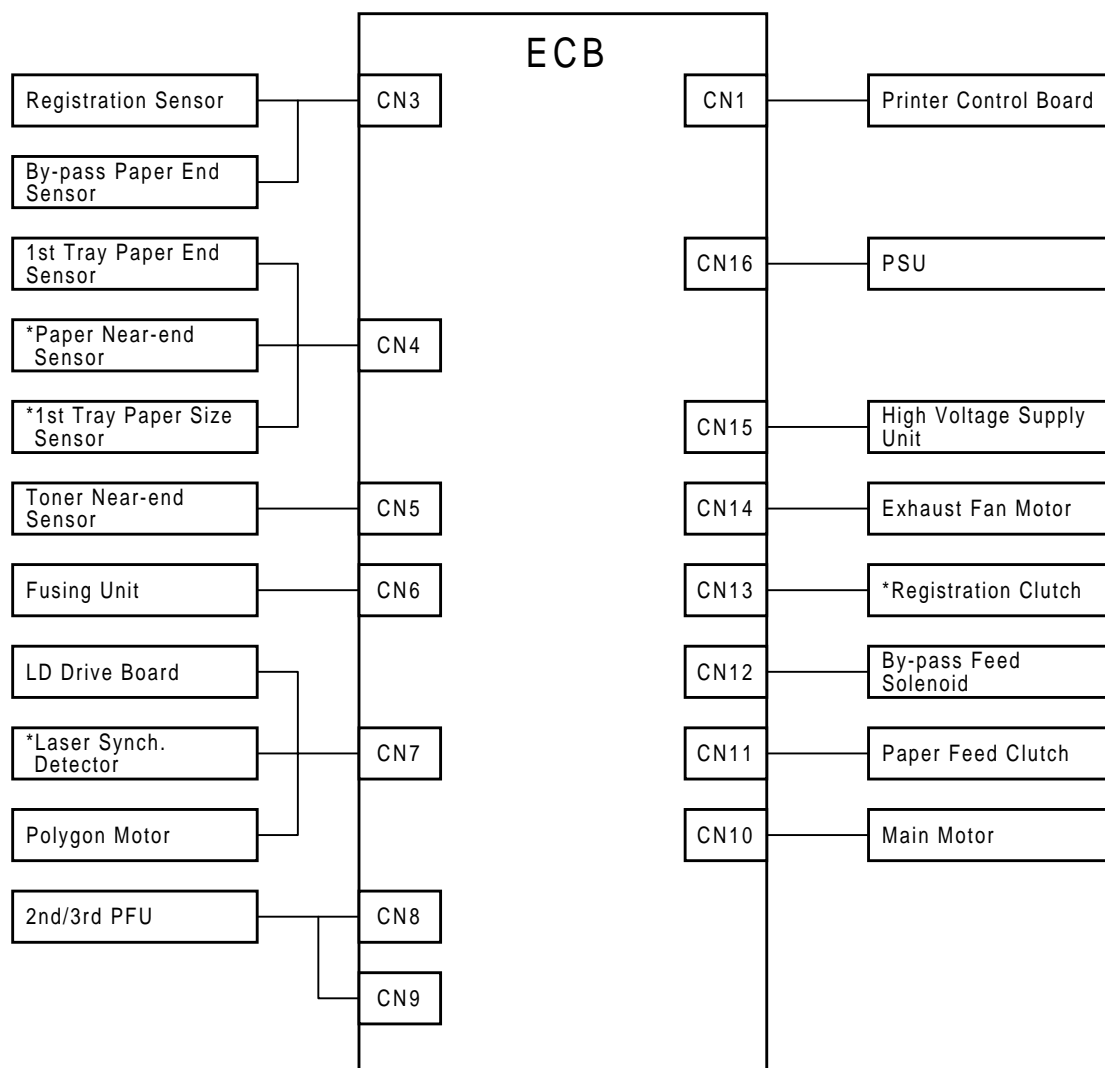
**2.8.2 DEVICES**

The engine control board controls the printer engine system.

<b>Devices</b>	<b>Functions</b>
CPU	16-bit microprocessor
	Internal RAM: 512 bits
Gate Array (GAZELLE)	Serial communication control for I/F controller
	Laser printing control
	Power width modulation (PWM) timer.
	LD driver sample hold function
	Pattern generation
	Fusing unit control timer
	I/O port
EPROM	128 K engine firmware ROM
EEPROM	Service maintenance information (counters, registration, etc.) 1 kbit
SRAM	32 KB
TB1	The test pattern will be printed when TB1 is shorted.

## 2.8.3 STRUCTURE

Detailed  
Descriptions

**2.8.4 CONNECTION TO THE ECB**

\* The G032 does not use the following:

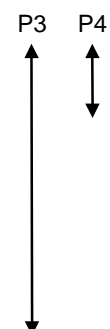
- 1) 1st paper size sensor
- 2) Paper near end sensor
- 3) Laser synchronization detector board (It is on the LD drive board.)
- 4) Registration clutch

CN	Description
CN1	Supplies +5 V to the printer control board. Also passes the video, engine control, and the serial data signals
CN3	Signals from the registration sensor and by-pass paper end sensor
CN4	Signals from the 1 <sup>st</sup> tray paper size and paper end sensors. For the G031, also from the 1 <sup>st</sup> tray paper near-end sensor.
CN5	Signal from the toner near-end sensor
CN6	Signals from the fusing unit thermistor (hot roller temperature) and the fusing exit sensor. Determines whether a 120 V or 200 V fusing unit is installed.
CN7	Automatic laser power control signal, video signal Polygon motor on/off and rotation speed control Detects the polygon motor lock condition. Signal from the laser synchronization detector (The detector is built into the LD drive board in the G032.)
CN8/9	Signals from the sensors in the optional paper feed units. Control for the clutches and motors
CN10	Main motor on/off control, and main motor lock detection
CN11	Turns the 1st tray paper feed clutch/solenoid on/off
CN12	Turns the by-pass tray solenoid on/off
CN13	Turns the registration clutch on/off (only used for G031)
CN14	Turns the fan motor on/off and controls the fan motor speed.
CN15	Controls the charge voltage, development bias, and transfer roller bias.
CN16	+5 V and +24 V from the PSU. The interlock switch cuts the +24 V when the front cover is opened. Controls the fusing unit safety relay Turns the power to the fusing unit on/off.

## SIGNAL TABLE

**2.9 SIGNAL TABLE**

CN	Signal	I/O	Description
CN1-A1	GND		
CN1-A2	GND		
CN1-A3	+5V		
CN1-A4	N.C		
CN1-A5	FGATE	O	Sub scan data printing area signal
CN1-A6	PPRDY	O	Printing ready
CN1-A7	/RDY	O	Printing enable
CN1-A8	/SBSY	O	Enables communication with the controller
CN1-A9	/SCLK	O	Synchronization clock for serial communication with the controller
CN1-A10	/STS	O	Serial status to the controller
CN1-B1	/VIDEO	I	Video data
CN1-B2	GND		
CN1-B3	+5V		
CN1-B4	+5V		
CN1-B5	/BD	O	Main scan synchronization signal.
CN1-B6	CPRDY	I	Controller power ready
CN1-B7	/PRINT	I	Printing request
CN1-B8	/CBSY	I	Enables communication from the controller
CN1-B9	/CCLK	I	Synchronization clock for serial communication from the controller
CN1-B10	/CMD	I	Serial command from the controller
CN2-1	+5V		
CN2-2	/RXD	I	Designer use only
CN2-3	/TXD	O	Designer use only
CN2-4	GND		
CN3-1	GND		
CN3-2	/REGST	I	Registration sensor signal
CN3-3	+5V		
CN3-4	GND		
CN3-5	MPEND	I	By-pass tray paper end signal
CN3-6	+5V		
CN4-1	GND		
CN4-2	FPEND	I	1st tray paper end signal
CN4-3	GND		
CN4-4	/FPNE	I	1st tray paper near-end signal
CN4-5	FPS0	I	1st tray paper size signal
CN4-6	FPS1	I	1st tray paper size signal
CN4-7	GND		
CN4-8	FPS2	I	1st tray paper size signal
CN5-1	GND		
CN5-2	/TEND	I	Toner near-end condition
CN5-3	N.C		
CN5-4	+5V		
CN6-1	GND		
CN6-2	/FSET0	I	Fusing unit 100V/200V selection





CN	Signal	I/O	Description
CN6-3	/FSET1	I	Fusing unit 100V/200V selection
CN6-4	/FSET2	I	Fusing unit 100V/200V selection
CN6-5	+5V		
CN6-6	FTEMP	I	Fusing unit temperature detection (analog)
CN6-7	GND		
CN6-8	/EXIT	I	Fusing exit sensor
CN6-9	+5V		
CN7-1	+24V	I	
CN7-2	GND		
CN7-3	XSMSTA	O	Polygon motor on signal
CN7-4	/SMLOK	I	Polygon motor lock signal
CN7-5	SMCK	O	Polygon motor clock signal
CN7-6	CHLDP	O	LD power signal (L: 600, H: 1200)
CN7-7	+5VS		
CN7-8	APCSH	O	LD drive signal
CN7-9	GND		
CN7-10	/VD	O	LD on signal
CN7-11	GND		
CN7-12	/LD EN	O	LD drive enable signal
CN7-13	/DETP	I	Main scan synchronization signal
CN7-14	+5V		
CN7-15	GND		
CN8-1	+24V		
CN8-2	GND		
CN8-3	GND		
CN8-4	+5V		
CN8-5	SNDCK	O	2nd PFU motor lock
CN8-6	XSNDFD	O	2nd PFU motor on
CN8-7	XSNDCL	O	2nd PFU paper end clutch on
CN8-8	SPSEN	I	2nd PFU paper feed sensor
CN8-9	EPEND	I	2nd PFU paper end detection
CN8-10	/OTSET	I	2nd PFU paper detection
CN9-1	CHG2	O	2nd/3rd PFU sensor select
CN9-2	OPS0	I	PFU paper size sensor signal
CN9-3	OPS1	I	PFU paper size sensor signal
CN9-4	OPS2	I	PFU paper size sensor signal
CN9-5	TRDCK	O	3rd PFU paper feed motor lock
CN9-6	/TRDFD	O	3rd PFU motor on
CN9-7	/TRDCL	O	3rd PFU paper feed clutch on
CN9-8	TPSEN	I	3rd PFU paper feed sensor
	/FCSET	I	No cassette signal for 1st tray (G032)
CN9-9	OPNE0	I	PFU paper near end condition
CN9-10	OPNE1	I	PFU paper near end condition
CN9-11	OPS0	I	PFU paper size detection
CN9-12	OPS1	I	PFU paper size detection
CN9-13	OPS2	I	PFU paper size detection
CN9-14	OPEND	I	PFU paper end detection
CN9-15	XOTSET	I	PFU paper detection

P3

P4

Detailed  
Descriptions

## SIGNAL TABLE

CN	Signal	I/O	Description
CN10-1	CHMMS	I	Main motor speed signal (H: 600, L: 1,200)
CN10-2	HMLOK	I	Main motor lock signal
CN10-3	/MMTR	O	Main motor on signal
CN10-4	GND		
CN10-5	GND		
CN10-6	+24V		
CN10-7	+24V		
CN11-1	+24V		
CN11-2	/FSTCL	O	1st tray paper feed clutch enable
CN12-1	+24V		
CN12-2	/MLTSOL	O	By-pass tray paper feed solenoid enable
CN13-1	+24V		
CN13-2	/REGCL	O	Registration clutch enable
CN14-1	+24V		
CN14-2	/FAN	O	Fan motor enable
CN15-1	N.C		
CN15-2	N.C		
CN15-3	CVFB	I	Transfer roller bias feedback signal
CN15-4	TCCFB	I	Transfer roller bias feedback current
CN15-5	MCVFB	I	Charge voltage feedback signal
CN15-6	BIUFB	I	Development bias feedback signal
CN15-7	/MCAC	O	Charge ac on
CN15-8	/BIAC	O	Development bias ac on
CN15-9	TCPWM-	O	Transfer roller charge (-) PWM signal
CN15-10	TCPWM+	O	Transfer roller charge (+) PWM signal
CN15-11	MCPWM	O	Charge roller PWM signal
CN15-12	BIPWM	O	Development bias PWM signal
CN15-13	GND		
CN15-14	+24V		
CN16-1	+24V		
CN16-2	GND		
CN16-3	+5V		
CN16-4	GND		
CN16-5	/FURLY	O	Fusing relay enable
CN16-6	/HEAT	O	Fusing lamp on
CN17-1	+24V		
CN17-2	/FULRY		Fusing relay on (Factory use)

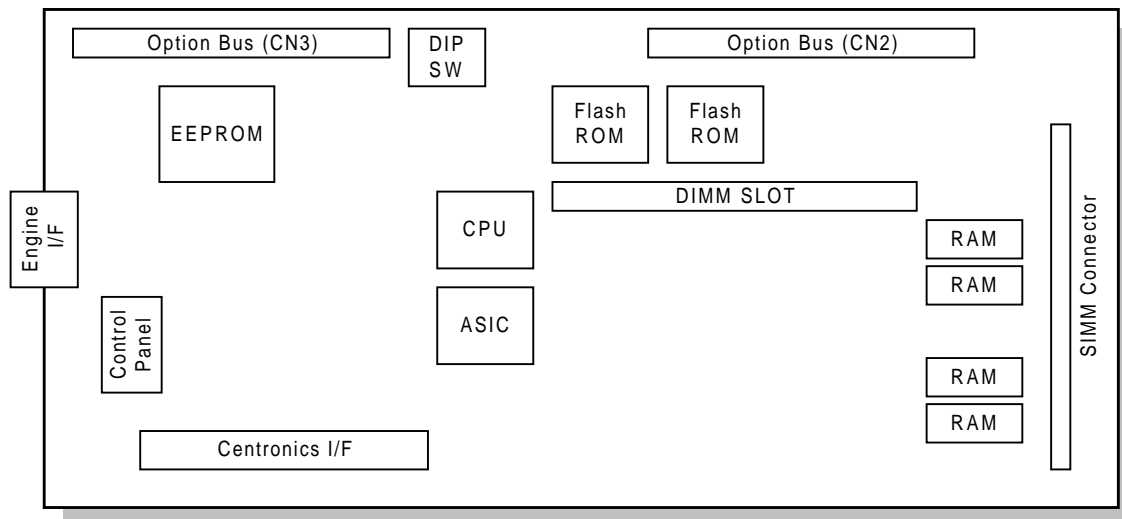
P3



## 2.10 PRINTER CONTROL BOARD

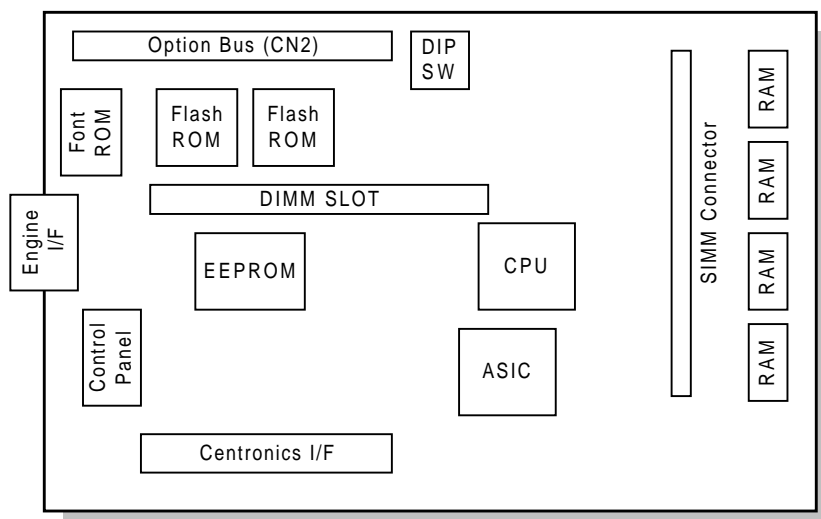
### 2.10.1 PCB LAYOUT

#### G031



Detailed  
Descriptions

#### G032



**2.10.2 DEVICES**

Devices	Description																	
CPU	133MHz VR4310																	
ASIC: ROCKY W	Memory map control																	
	Reset signal																	
	DRAM control																	
	DMA control																	
	FCI control (edge smoothing, toner saving)																	
	Interrupt control																	
	Engine serial communication control																	
	Interval control																	
	Centronics I/F																	
	I/O port																	
Code ROM	Flash ROM (8 MB) 32 bit																	
DRAM	8 MB (16 Mbit DRAM x 4)																	
EEPROM	2 KB (NVRAM)																	
Centronics I/F	Bi-directional parallel interface (standardized by IEEE1284)																	
OPTION I/F	G031: 2 slots RS232C Ethernet (100 Base-Tx, 10 Base-T) Hard disk drive IC Card adapter for up-dating controller firmware (CN3)																	
	G032: 1 slot Ethernet (100 Base-Tx, 10 Base-T) Hard disk drive IC Card adapter for up-dating controller firmware																	
Optional RAM I/F	SIMM x 1 slot, 16 MB or 32 MB SIMM																	
DIMM I/F	1 slot																	
DIP SW	<div><div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div></div><div></div><div></div><div></div></div><div>- OFF -</div></div></div> <table><tr><th>SW No.</th><th>Setting</th><th>Description</th></tr><tr><td rowspan="2">1</td><td>OFF</td><td>Booting from Flash ROM</td></tr><tr><td>ON</td><td>Booting from IC card using adapter</td></tr><tr><td>2</td><td></td><td>Not used</td></tr><tr><td>3</td><td></td><td>Not used</td></tr><tr><td>4</td><td></td><td>Not used</td></tr></table>	SW No.	Setting	Description	1	OFF	Booting from Flash ROM	ON	Booting from IC card using adapter	2		Not used	3		Not used	4		Not used
SW No.	Setting	Description																
1	OFF	Booting from Flash ROM																
	ON	Booting from IC card using adapter																
2		Not used																
3		Not used																
4		Not used																

CÓPIA NÃO CONTROLADA

# INSTALLATION

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

## 3. INSTALLATION

### 3.1 INSTALLATION REQUIREMENTS

#### 3.1.1 ENVIRONMENT

1. Temperature Range: 10°C to 32°C (50°F to 89.6°F)
2. Humidity Range: 15% to 80% RH
3. Ambient Illumination: Less than 1,500 lux (do not expose to direct sunlight.)
4. Ventilation: Room air should turn over at least 3 times/hr/person
5. Ambient Dust: Less than 0.10 mg /m<sup>3</sup> (2.7 x 10<sup>-6</sup> oz/yd<sup>3</sup>)
6. Avoid areas which are exposed to sudden temperature changes. This includes:
  - 1) Areas directly exposed to cool air from an air conditioner.
  - 2) Areas directly exposed to heat from a heater.
7. Do not place the machine in an area where it will be exposed to corrosive gases.
8. Do not install the machine at any location over 2,000 m (6,500 ft.) above sea level.
9. Place the machine on a strong and level base. (Inclination on any side should be no more 5 mm.)
10. Do not place the machine where it may be subjected to strong vibrations.

#### 3.1.2 POWER REQUIREMENTS

##### CAUTION

1. Make sure that the wall outlet is near the machine and easily accessible.
2. Make sure the plug is firmly inserted in the outlet.
3. Avoid multi-wiring.
4. Be sure to ground the machine.

1. Input voltage level: Stinger - P3
  - 120 V, 60 Hz: More than 8.0 A (for North America)
  - 220 V ~ 240 V, 50/60 Hz: More than 8.0 A (for Europe)
 Stinger - P4
  - 120 V, 60 Hz: More than 6.0 A (for North America)
  - 220 V ~ 240 V, 50/60 Hz: More than 5.0 A (for Europe)
2. Permissible voltage fluctuation : 5%
3. Do not set anything on the power cord.

## **3.2 PRINTER INSTALLATION**

See the “Quick Installation Guide” sheet that comes with the printer.

## **3.3 PAPER FEED UNIT INSTALLATION**

See the “Installing the Paper Feed Unit” section in the Operating Instructions.

## **3.4 ENVELOPE FEEDER INSTALLATION**

See the “Installing the Envelope Feeder” section in the Operating Instructions.

## **3.5 HARD DISK INSTALLATION**

See the “Hard Disk Installation” sheet that comes with the option.

## **3.6 MEMORY UNIT INSTALLATION**

See the “Installing the Memory Unit” section in the Operating Instructions.

## **3.7 NETWORK INTERFACE BOARD INSTALLATION**

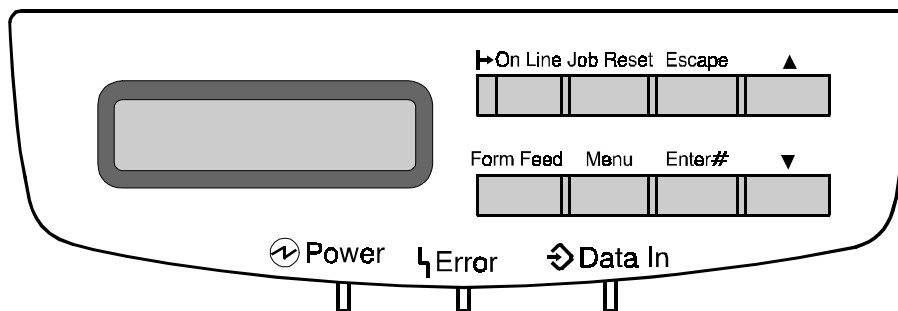
See the “Installing the Network Interface Board” section in the Operating Instructions.



### 3.8 CHECKING THE CONNECTIONS

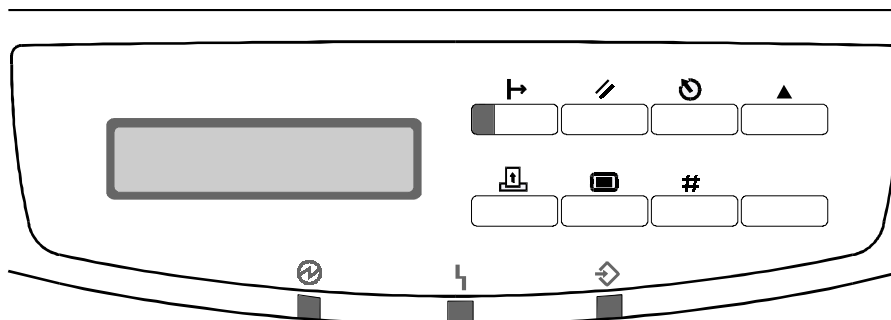
#### 3.8.1 CONNECTION BETWEEN MAIN PRINTER CONTROL BOARD (AND RELATED OPTIONS: HDD, RAM SIMM, NIC) AND OPTIONAL HDD & PERIPHERALS

G031/032-17



Installation

G031/032-22, -27, -29



Please refer to the key names and locations in the above illustration.

1. Plug in the power cord and turn on the main switch. Then “Ready” is displayed.
2. Press the “Menu” key to enter the Main Menu.
3. Press the “Arrow” key to select List Print.
4. Press the “Enter” key to enter the List Print menu.
5. Press the “Enter” key twice to print the System Config. page.

**NOTE:** For more detailed information about the machine operation panel settings, refer to the Operating Instructions.

CÓPIA NÃO CONTROLADA

CHECKING THE CONNECTIONS

An example of the configuration page follows.

<b>Model Name</b>		<b>Configuration Page</b>	
<b>Reference</b>		<b>Host Interface</b>	
Firmware Version	2.23.22	Print Language	Auto
Engine Version	1.1	Network Setup	
Pages Printed	123456	IP Address	133.139.211.6
Maintenance Counter	43456	Subnet Mask	255.255.255.0
Total Installed RAM	36 MB	Gateway Address	133.139.211.1
Hard Disk	815 MB	RS232C Setup	
Network Card	Ethernet	Baud Rate	9,600
DIMM Card	Attached	Parity	None
		Flow Control	Xon/Xoff
		Data Bits	8
		Stop Bits	1
		DTR Polarity	High
<b>Paper Input</b>			
Tray Priority	Tray 1		
Tray Locking	None		
Tray Size			
By-pass Tray	Letter 8 1/2 x 11		
Tray 1	Letter 8 1/2 x 11		
Tray 2	Letter 8 1/2 x 11		
Tray 3	Letter 8 1/2 x 11		
Thick Paper	Off		
<b>Print Quality</b>		<b>PostScript</b>	
Edge Smoothing	Off	PostScript Version	72.103
Resolution	1,200 dpi	Print PS Errors	off
Image Density	Normal		
Toner Saving	On		
<b>System</b>		<b>Ethernet</b>	
Copies	1	Software Version	5.01
Jam Recovery	On	Hardware Address	00:00:C9:00:00:07:82
I/O Timeout	30 seconds	Novell (IPX/SPX)	
Energy Saver	30 minutes	Pserver Name	RDP-000123
Auto Continue	Off	Frame Type	802.2
Page Protect	On	TCP/IP	
<b>PCL Menu</b>		IP Address	133.139.211.6
Orientation	Portrait	Gateway	133.139.211.1
Form Length	60	Subnet Mask	255.255.255.0
Font Source	Internal		
Font Number	0		
Font Height	12.00		
Font Pitch	10.00		
Symbol Set	Roman 8		

## Model Name

### Reference

Firmware Version	2.23.22	—— [A]
Engine Version	1.1	—— [B]
Pages Printed	123456	
Maintenance Counter	43456	—— [C]
Total Installed RAM	36 MB	—— [D]
Hard Disk	815 MB	—— [E]
Network Card	Ethernet	—— [F]
DIMM Card	Attached	—— [G]

The maintenance counter [C] shows the main motor work time counter (the unit is 5000 seconds).

Check the following:

- For the main printer control board, check that the machine prints the configuration page fully.
- For the RAM SIMM, confirm that “Total Installed RAM” [D] on the printout shows the size of the module just installed, plus 8 Mbytes (the base memory on the board).
- For the hard disk, confirm that “Hard Disk” [E] printed on the configuration page shows the size of the hard disk.
- For the NIB, confirm that “Network Card” [F] printed on the configuration page shows the type of network card.
- For the PCL version of the printer control board, check “Firmware Version” [A].
- For the software version of the engine control board, check “Engine Version” [B].

If there are any problems with the above check items, reinstall the printer controller and other options. Then set up the machine again and test it again.

CHECKING THE CONNECTIONS

### 3.8.2 CONNECTION BETWEEN PRINTER CONTROL BOARD AND NETWORK INTERFACE BOARD

There are three ways to check the connection between the main printer control board and the network interface board.

- Check that the configuration page includes Ethernet settings.
- Check the “NIB Setup” menu in the Host Interface menu on the machine’s operation panel.
- Print out the Network Interface Board Configuration Sheet with the network information (see below).

### 3.8.3 PRINTING THE NETWORK INTERFACE BOARD CONFIGURATION SHEET

**NOTE:** The NIB configuration sheet will be printed out once just after turning on for the first time when the NIB is installed.

1. Install the network interface board.
2. Turn on the main switch and wait for a few minutes.
3. The configuration sheet will be printed automatically.

**NOTE:** If the printer does not print the network interface board configuration sheet, check the NIB setup menu in the Host Interface menu (user program mode). If this menu is not displayed, the NIB is not connected properly.

If any problem occurs during the above steps, reinstall the NIB and other options, then set the machine up again and test it again.

# **SERVICE TABLES AND PROCEDURES**

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

## 4. SERVICE PROCEDURES AND TABLES

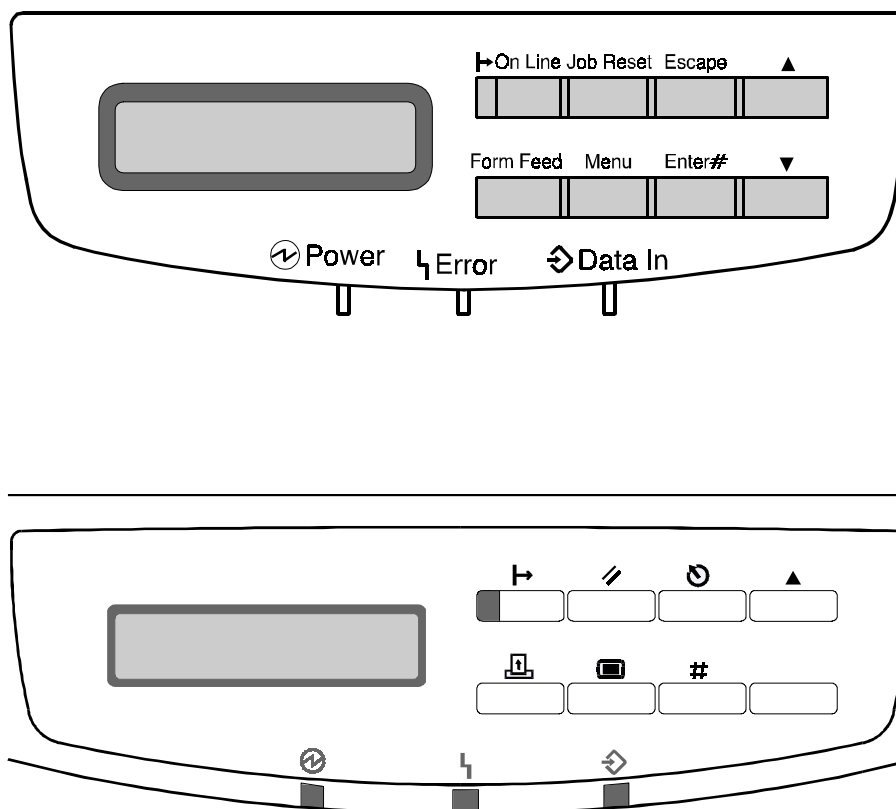
### 4.1 OVERVIEW

There are three service menus with this machine.

- Service Program Mode: This contains most of the field procedures, and is covered in section 4.2
- IC Card Boot Service Mode: Most of these features are covered in the Appendix, which describes procedures that are mainly for use in the service station.
- Service Tool Menu: This is also covered in the Appendix.

#### *Operation panel*

Please refer to the illustration for the key names and their locations.



Service  
Tables and  
Procedures

## 4.2 SERVICE PROGRAM MODE

### CAUTION

Before accessing the service menu, do the following:

Confirm that there is no print data in the printer buffer (the Data In LED must not be lit or blinking).

If there is some data in the buffer, wait until all data has been printed.

### 4.2.1 ENABLING AND DISABLING SERVICE PROGRAM MODE

#### *Enabling the Service Mode*

1. Turn the machine on while pressing the “On Line” key and “Escape” key together until the service mode menu appears on the display.
2. When the machine goes into the service mode, all LEDs are lit.
3. Use the “arrow” keys to scroll through the menu listing. To select an item, press the “Enter” key. Then the sub-menu will appear.
4. To return to the 1st level menu, press the “Escape” key several times.

**NOTE:** If the “On Line” key and “Escape” key are not pressed together while turning on, the service mode menu will not be available.

#### *Disabling the Service Mode*

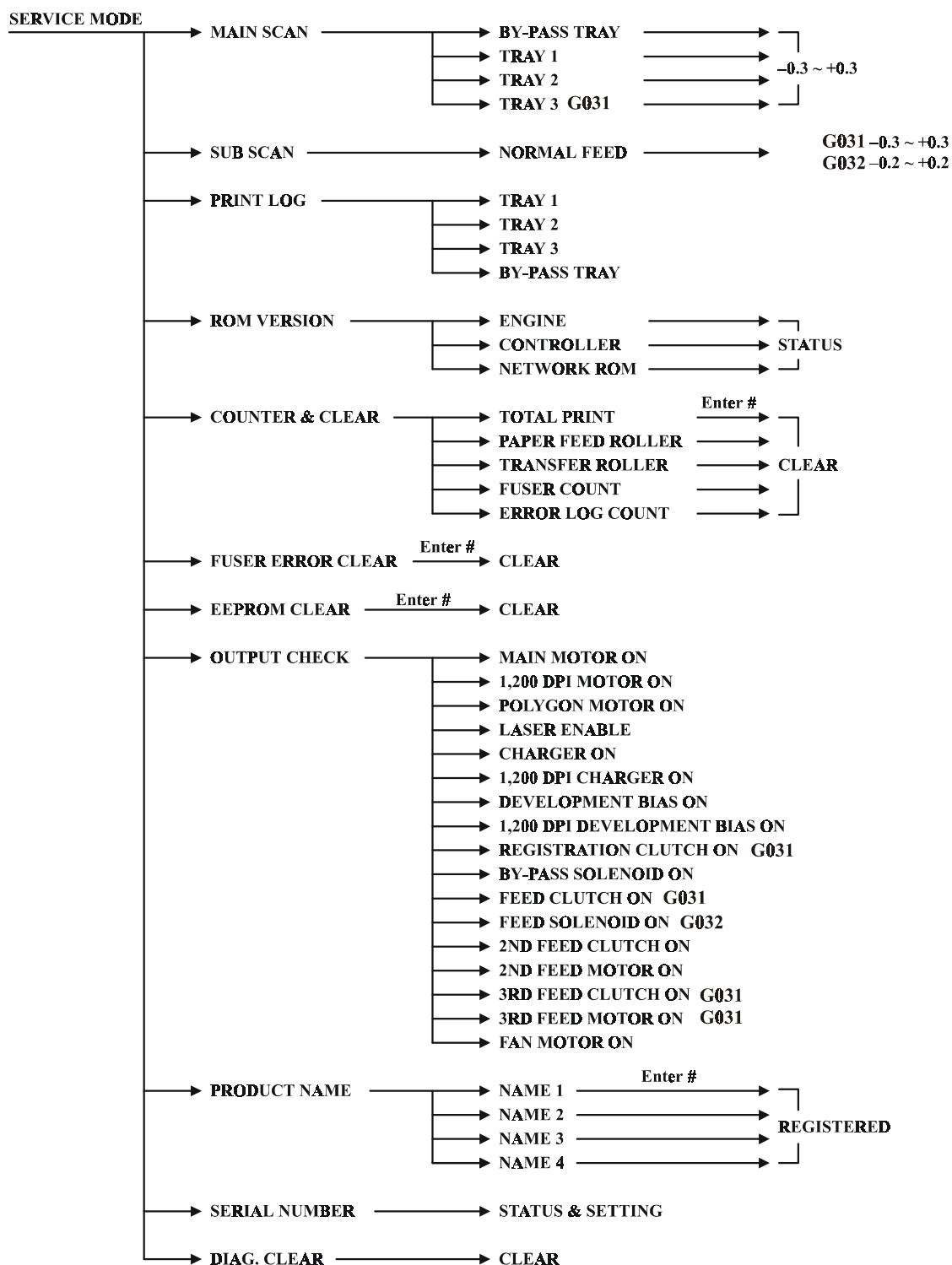
There are two ways to exit the service mode.

1. Turning off and on
  - 1) Turn off the machine.
  - 2) Wait for a few seconds and then turn it on again. The user mode menu will appear.
2. “Form Feed” key and “Escape” key
  - 1) Press the “Form Feed” key and “Escape” key together.
  - 2) Wait a few seconds. The machine exits service mode automatically.
  - 3) The printer starts to initialize.



## 4.2.2 SERVICE PROGRAM MODE MENU TREE

The following diagram shows the service mode menu tree.



*Service Mode Submenu*

SERVICE PROGRAM MODE

***Accessing the Required Program***

Select each program level in sequence.

1. Scroll through the 1st level programs using the “Up/Down arrow” keys. Then press the “Enter” key.
2. Scroll through the items in the next lowest level using the “Up/Down arrow” keys. To go back to a higher level, press the “Escape” key.

***Inputting a Value or Setting for a Service Program***

1. Enter the required program mode as explained above.  
**NOTE:** The setting appearing initially on the display is the current setting.
2. Select the required setting using the “Up/Down arrow” keys, then press the “Enter” key.  
**NOTE:** The previous value remains if the “Enter” key is not pressed.
3. Exit service mode.

### 4.2.3 SERVICE MODE MENU TABLE

In the Function column, comments are in italics.

Menu Level			Function	Settings
Level 1	Level 2			
Main Scan	Tray 1	Side-to-side Registration (Feed from Paper Tray 1)	Adjusts the printing side-to-side registration from paper tray 1 using the frame on the Print Log. <i>Use the “▲/▼” keys to increase or decrease. See “Replacement and Adjustment - Print Registration Adjustments” for details.</i>	-0.3 ~ +0.3 mm 0.1 mm/step
	Tray 2	Side-to-Side Registration (Feed from Tray 2 - Optional Paper Feed Unit)	Adjusts the printing side-to-side registration from paper tray 2 using the frame on the Print Log. <i>Use the “▲/▼” keys to increase or decrease. See “Replacement and Adjustment - Print Registration Adjustments” for details.</i>	-0.3 ~ +0.3 mm 0.1 mm/step
	Tray 3 (G031)	Side-to-side Registration (Feed from Paper Tray 3 - Optional Paper Feed Unit)	Adjusts the printing side-to-side registration from paper tray 3 using the frame on the Print Log. <i>Use the “▲/▼” keys to increase or decrease. See “Replacement and Adjustment - Print Registration Adjustments” for details.</i>	-0.3 ~ +0.3 mm 0.1 mm/step
	By-pass Tray	Side-to-Side Registration (Feed from Bypass Tray)	Adjusts the printing side-to-side registration from the bypass tray using the frame on the Print Log. <i>Use the “▲/▼” keys to increase or decrease. See “Replacement and Adjustment - Print Registration Adjustments” for details.</i>	-0.3 ~ +0.3 mm 0.1 mm/step
Sub Scan	Normal Feed	Leading Edge Registration (Normal Printing)	Adjusts the printing leading edge registration using the frame on the Print Log. <i>Use the “▲/▼” keys to increase or decrease. See “Replacement and Adjustment - Print Registration Adjustments” for details.</i>	-0.3 ~ +0.3 mm for G031 -0.2 ~ +0.2 mm for G032 0.1 mm/step
Counter Clear	Total Print	Total Print & Counter Reset	Views and resets the total print counter.	
			<i>To view the counter, press the “Enter” key then press the “Escape” key.</i>	
			<i>To reset the counter, press the “Enter” key again after the counter is displayed.</i>	

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Menu Level			Function	Settings
Level 1	Level 2			
Counter Clear	Paper Feed	Paper Feed Roller Counter & Reset	Views and resets the paper feed counter.	
			<i>To view the counter, press the "Enter" key then press the "Escape" key.</i>	
			<i>To reset the counter, press the "Enter" key again after the counter is displayed.</i>	
	Transfer Roller	Transfer Roller Counter & Reset	Views and resets the transfer roller counter.	
			<i>To view the counter, press the "Enter" key then press the "Escape" key.</i>	
			<i>To reset the counter, press the "Enter" key again after the counter is displayed.</i>	
	Fusing	Fusing Counter & Reset	Views and resets the fusing counter.	
			<i>To view the counter, press the "Enter" key then press the "Escape" key.</i>	
			<i>To reset the counter, press the "Enter" key again after the counter is displayed.</i>	
	Error Log & Counter	Error Log/ Counter & Reset	Views and resets the error log list and the error log counters.	Up to ten errors are registered. These are the same as the 'Error Logging' entries on the Print Log.
			<i>To view the log and counters, press the "Enter" key then press the "Escape" key.</i>	
			<i>To clear the log and counters, press the "Enter" key again after it is displayed.</i>	
EEPROM Clear		Memory All Clear on Engine Control Board	Resets all software counters. Also, resets all adjustment settings and log entries.	
			<b>Normally, this service mode should not be used.</b>	
Fusing Error Clear		Clear the Fuser Error	Resets a fusing unit error.	
Print Log			Prints the print log	
			<i>To print the log sheet, select the tray using the "▲/▼" keys then press the "Enter" key. See the "Print Log" section for details.</i>	
ROM Version	Engine	ROM Version Display (ECB)	Displays the Engine Control Board ROM version.	
	Controller	F/W Version Display (Main Control Board)	Displays the main printer control board firmware version.	
	Network ROM	NIB Firmware version Display	Displays the NIB firmware version.	

Menu Level			Function	Settings
Level 1	Level 2			
Output Check	Main Motor		To check the outputs, press the “Enter” key. Press the “Enter” key again to stop the check. The menu will go back to level 2 when the “Escape” key is pressed.  <b>Note:</b> 1. OK/NG are not displayed. 2. To prevent mechanical or electrical damage, do not keep an electrical component on for a long time.  Charger: Charge roller	
	1,200 dpi Motor			
	Polygon Motor			
	Laser Enable			
	Charger ON			
	1,200 dpi Charger ON			
	Development Bias ON			
	1,200 dpi Development Bias ON			
	Registration Clutch ON (G031)			
	By-pass Solenoid ON			
	Feed Clutch ON (G031)			
	Feed Solenoid ON (G032)			
	2nd Feed Clutch ON			
	2nd Feed Motor ON			
	3rd Feed Clutch ON (G031)			
	3rd Feed Motor ON (G031)			
Fan Motor				
Product Name		Plug and Play Model Name	Select the product name <i>Use the “▲/▼” keys to select the name. This name is used for the plug and play name and is indicated on the top of configuration page and print log.</i>	
	<b>Note:</b> 1. The product name is stored in the NVRAM on the controller board. 2. Macintosh printers use the product name as a printer name. 3. When the IC Card boot menu NVRAM clear is done, store the product name again. 4. User settings stored in the NVRAM are reset when the product name is changed.			

## SERVICE PROGRAM MODE

Menu Level			Function	Settings
Level 1	Level 2			
Serial Number		Printer ID Setting	Views and stores the printer ID	
			<i>To view the printer ID, press the “Enter” key.</i>	
			<b><i>Normally, the printer ID should not be changed.</i></b>	
	<b>Note:</b> 1. The serial number is stored in the NVRAM on the controller board. 2. The printer ID is checked during font downloading. 3. Store the same number when the NVRAM is cleared with the IC card boot menu. 4. The product number of the controller board is used as the printer ID and stored in the factory.  See the “Printer ID” section how to store the serial number.			
Diag. Clear		Diagnostic Error Log Clear	Clear the diagnostic error log.	
			<i>To clear the log, press the “Enter” key.</i>	

## 4.2.4 PRINT LOG

### Sample

An example of the print log follows.

PRINT LOG	98877669-MODEL NAME	[A]
ROM version		
Engine ROM version	: V1.10	[B]
Controller ROM version	: V1.00	[C]
Network ROM version	: V5.32	[D]
Register Setting		
Sub Scan (-3.0 mm to +3.0 mm)		
Normal Feed	: -0.5	[E]
Main Scan (-3.0 mm to +3.0 mm)		
By-pass Tray	: +0.5	
Tray 1	: +1.0	A4 [2/2]
Tray 2	: +1.0	DLTR [1/4]
Tray 3	: +1.0	FREE [2/4]
		[F]
Transition	: Normal	[G]
Density	: Light 2	
Total Print Count	: 1	[Unit: 1 page]
Motor Work Time	: 0	[Unit: 5000 sec]
Paper Feed Roller Counter	: 0	[Unit: 5000 sec]
Transfer Roller Counter	: 0	[Unit: 5000 sec]
Fuser Counter	: 0	[Unit: 5000 sec]
		[H]
Error Logging		
1. Paper Feed Jam	: 00000010	[Unit: 200 pages] [I]
2.	:	
3.	:	
4.	:	
5.	:	
6.	:	
7.	:	
8.	:	
9.	:	
10.	:	
Diagnostic Error Logging		
1. OPTION DIMM	: 0 X 1010	
2. OPTION NIC	: 0 X 1301	
3. ASIC P1284	: 0 X 0902	
4. OPTION NIC	: 0 X 1301	[J]
5. ASIC P1284	: 0 X 0902	
6. ASIC P1284	: 0 X 0902	
7.	:	
8.	:	
9.	:	
10.	:	
		[K]

***Printing the Log Sheet***

To print the log sheet, do the following.

1. Turn on the machine while pressing the “On Line” key and “Escape” key together to enter the service mode.  
**NOTE:** For the key locations, see “Enabling and Disabling Service Program Mode”.
2. Use the “arrow” keys until “PRINT LOG” appears. Then press the “Enter” key.
3. Use the “arrow” keys to select the appropriate tray then press the “Enter” key.

***Items on the Log Sheet*****[A]: Serial Number and Model Name (Printer ID)**

The serial number and model name are stored in the NVRAM on the printer control board. The Printer ID consists of the serial number and the model name together.

**- Serial Number -**

The 8-digit serial number is stored in the factory. Each printer control board has a serial number and it is printed on the PCB.

Normally, when the printer control board is changed, the NVRAM on the board is removed and then installed on the new board. In this case, do not change the serial number (the machine’s Printer ID must never be changed, regardless of the printer control board serial number). After clearing the NVRAM or replacing the NVRAM, the original number must be stored again, using ‘Serial Number’ in service program mode.

See the “Printer ID” section for the purpose of the printer ID and how to store it.

**- Model Name -**

The model name is the same as the product name input with service program mode. The model name is stored in the factory and is used for the “plug and play” name. Normally, the product name does not have to be changed in the field. After clearing the NVRAM or replacing the NVRAM, restore the model name using ‘Product Name’ in service program mode.

**NOTE:** When the model name is restored by service program mode in the field, the NVRAM will be partially cleared (user settings such as print quality settings and system settings on the configuration sheet are reset).

If the NVRAM was cleared and the product name was lost, when the log sheet is printed, “?????” is marked on the log print.

Refer to the “IC Card Boot Service Menu” section for how to reset the NVRAM.

**[B]: Engine ROM version**

The engine control board firmware version. This firmware can only be updated by replacing the EPROM on the engine control board.



**[C]: Controller ROM version**

The printer control board firmware version. The controller firmware consists of PCL firmware, PostScript firmware and diagnostic firmware. The controller ROM version changes when one or more of these is updated.

The controller firmware version is stored in the NVRAM on the printer control board. Only the controller firmware can be installed by the IC card, DIMM card and downloading from PC. The engine firmware and NIB firmware cannot be installed using these methods.

**[D]: Network ROM version**

The NIB firmware version. The firmware can be updated with utility software on a PC connected to the NIB through the network.

**[E]: Sub Scan/Main Scan**

Registration has been adjusted in the factory. The settings are stored in the EEPROM on the ECB. When the EEPROM is cleared with service program mode or is replaced in the field, the settings go to the defaults. Before clearing or replacing the EEPROM, note the current values, then re-input them afterwards.

**[F]: Tray paper status**

This shows the paper size and amount of paper remaining. The remaining paper is showed in 2 steps (for the 1<sup>st</sup> tray) or 4 steps (for the 2<sup>nd</sup> and 3<sup>rd</sup> trays). "0/4" means no paper and "4/4" means the tray is full.

**[G]: Transition/Density**

This shows the transfer current and image density settings in the engine board. These are user settings, and they go to normal when the EEPROM is cleared.

**[H]: Counters**

These counters can be reset using counter clear in the service program mode menu, except for the motor work time. All counters are cleared when the EEPROM is cleared.

The motor work time, paper feed roller counter, transfer roller counter, and fusing unit counter are counted by the main motor rotation. The counters go up by one every 5,000 seconds of motor working time.

These counters (except the motor work time) can be checked on the display using the service program mode. To see the motor work time, look at "Maintenance Counter" on the configuration page.

The paper feed roller counter, transfer roller counter and fuser counter are automatically reset when new fusing unit in the Maintenance KIT is installed (G031).

When the PM clear is performed by user menu, these counters are reset.

## SERVICE PROGRAM MODE

**[I]: Error Logging**

The ten latest engine errors are logged. The counters go up every 200 prints. For example, if the counter shows 10, the error occurred somewhere between print numbers 2,000 and 2,199.

The errors included here are:

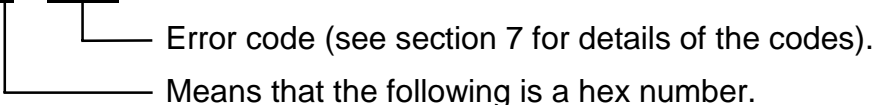
- Paper Feed Jam
- Transport Jam
- Paper Exit Jam
- Fuser Reload Error (could not return to the 'ready to print' temperature)
- Fuser Heater High Error
- Fuser Heater Low Error
- Synchronizing Pulse Error (for the laser)
- Polygon Motor Error
- Main Motor Error
- High Voltage Error (high voltage power supply)

The log is stored in the EEPROM and can be cleared using counter clear in the service program mode menu.

**[J]: Diagnostic Error Logging**

The ten latest errors are logged. The log is stored in the NVRAM and can be cleared by 'Diag clear' in the service program mode menu. When the printer control board is replaced and the old NVRAM is installed on the new board, the diagnostic errors should be cleared because these errors occurred with the old printer control board.

e.g. 0 x 1010



Error code (see section 7 for details of the codes).

Means that the following is a hex number.

**[K]: Print Log Frame**

This frame is drawn a sixth of an inch (4.2 mm) from the paper edges. The registration is adjusted in the factory. If the registration has drifted, adjust the sub scan or the main scan (see "Replacement and Adjustment - Print Registration Adjustment").

## 4.2.5 PRINTER ID

### *Overview*

The user can buy fonts and install them in the printer hard disk. The font software uses the printer ID to prevent the fonts from being downloaded to several printers illegally. The fonts must be downloaded to one printer only.

The original printer ID is stored in the NVRAM on the printer control board in the factory. The serial number of the printer control board is used for the ID. When the printer control board is replaced in the field, the old NVRAM is installed on the new board. In this case, the printer ID does not need to be restored.

When the NVRAM is cleared or changed because of a hardware problem, the original printer ID must be restored.

### *Restoring the Printer ID*

The printer ID can be stored using the service program mode as follows.

1. Turn on the printer while pressing the “Online” key and “Escape” key together to enter the service menu.

**NOTE:** For the key locations, see “Enabling and Disabling Service Program Mode”.

Service Mode:  
1. Main Scan

Use the “arrow” key.

Service Mode:  
10. Serial Number

Press the “Enter” key.

Serial Number:  
80900082

An 8-digit numeral appears.

2. Press the “Online” key, “Form feed”, “Menu” key, and “Up arrow” key at the same time

A cursor will appear under the 1st digit.

Serial Number:  
80900082

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3. Use the “arrow” key to change the number and press the “Enter” key to store the displayed number.

**NOTE:** Store the same number which had been stored previously (see the top of the Print Log sheet).

The printer control board has a serial number printed on the board, but if the old board had been replaced earlier, the serial number on the new board must not be used for the Printer ID.

Serial Number:  
10000000

4. Then the cursor shifts to the right.

Serial Number:  
12345678

5. To store the number in the display, press the “Enter” key.

Service Mode:  
10. Serial Number

6. The display goes back to the top menu.

7. Use the “arrow” keys to select “PRINT LOG”.

Service Mode:  
3. PRINT LOG

8. Print the log sheet and check that the printer ID at the top of the page (serial number and model name) is correct.

## 4.3 IC CARD BOOT SERVICE MODE

### 4.3.1 OVERVIEW

The IC card booting service menu is accessed only by booting from an IC card. The IC card is prepared as a service tool.

**NOTE:** A blank IC card cannot be used to boot up the printer.

### 4.3.2 ENABLING AND DISABLING IC CARD BOOT SERVICE MODE

#### *To enter the service mode*

1. Turn the printer off.
2. Turn on DIP SW 1 on the printer control board.
3. Plug the IC card into the IC card adapter, then connect it to the option bus connector.

**NOTE:** The G031 has two option bus connectors. The left connector can only be used for this function.

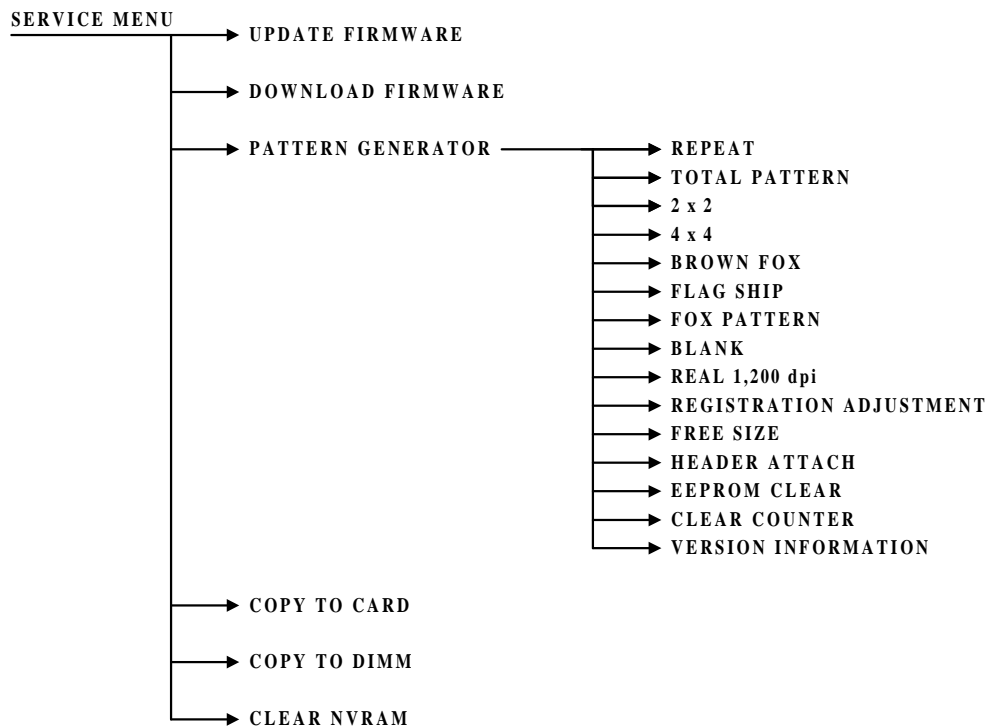
4. Turn the printer on. The IC card boot service menu will be displayed.

#### *To exit the service mode*

1. Turn the printer off.
2. Remove the IC card and IC card adapter.
3. Turn DIP SW 1 to off.
4. Turn on the printer again.
5. Then, the user menu will appear.

**NOTE:** Don't forget to return DIP SW1 to the off position. Otherwise the printer will not boot.

### 4.3.3 IC CARD BOOT SERVICE MODE TREE



#### ***Accessing the Required Program***

Select each program level in sequence.

1. Scroll through the 1st level programs using the “Up/Down arrow” keys. Then press the “Enter” key.
2. Scroll through the items in the next lowest level using the “Up/Down arrow” keys.
3. To go back to a higher level, press the “Escape” key.

### 4.3.4 SERVICE MENU TABLE

Menu Item	Function
Update Firmware	Update controller firmware using an IC card.
	For details, see the appendix, and “Downloading New Controller Software” in this section.
Download Firmware	Download firmware from a PC through a parallel cable.
	See the appendix for details.
Copy to DIMM	Download firmware to a DIMM card from a PC through a parallel cable.
	See the appendix for details.
Copy to CARD	Download firmware to an IC card from a PC through a parallel cable.
	See the appendix for details.
Clear NVRAM	Clear the NVRAM
	To clear the NVRAM, press the “Enter” key twice. Normally, NVRAM clear should not be used. <b>Note:</b> This resets all the settings stored in the NVRAM to their default settings. This procedure is required only after replacing the NVRAM chip.
TEST Print	Print controller generated test pattern (Factory use) See the appendix for details.

## 4.4 EEPROM AND NVRAM RESET PROCEDURES

The following table shows what data is stored in the EEPROM and NVRAM.

EEPROM (ECB)	NVRAM (Printer Control Board)
Registration settings	User settings for the controller
Transfer current settings	Product name (plug and play)
Image density	Controller serial number
Motor work time	Diagnostic error logging
Paper feed roller counter	Controller firmware version
Transfer roller counter	
Fusing unit counter	
Error logging	

**NOTE:** When the EEPROM or NVRAM is cleared, all the data in the memory shown above is cleared.

Memory clear procedures

- Service Program Mode - EEPROM Clear
- IC Card Boot Service Mode – NVRAM Clear



## 4.5 DOWNLOADING NEW CONTROLLER SOFTWARE

### 4.5.1 OVERVIEW

This section explains how to upgrade the controller firmware using an IC card, also known as a flash card. (Other methods are available for this model, and these are explained in the appendix.)

The engine board and NIB firmware cannot be upgraded in this way.

- The NIB has special procedures (see the manual for the NIB)
- The engine firmware is upgraded by changing the ROM.

The firmware has to be stored on the IC card in advance, either using SwapBox or the service tool menu. This is also covered in the appendix. (The service tool menu allows firmware to be copied from a PC, through a parallel cable, to an IC card plugged into the printer.)

To connect the IC card to the printer, an IC card adapter is required. This adapter plugs into one of the option bus connectors on the printer control board. The IC card adapter is provided as a service tool.

If power is interrupted during downloading, the printer can boot again with the previous firmware except if it happens while downloading the boot area. In this case, the printer must be booted with an IC card.

**NOTE:** For additional details see Appendix, "Downloading Controller Firmware for G031/G032"

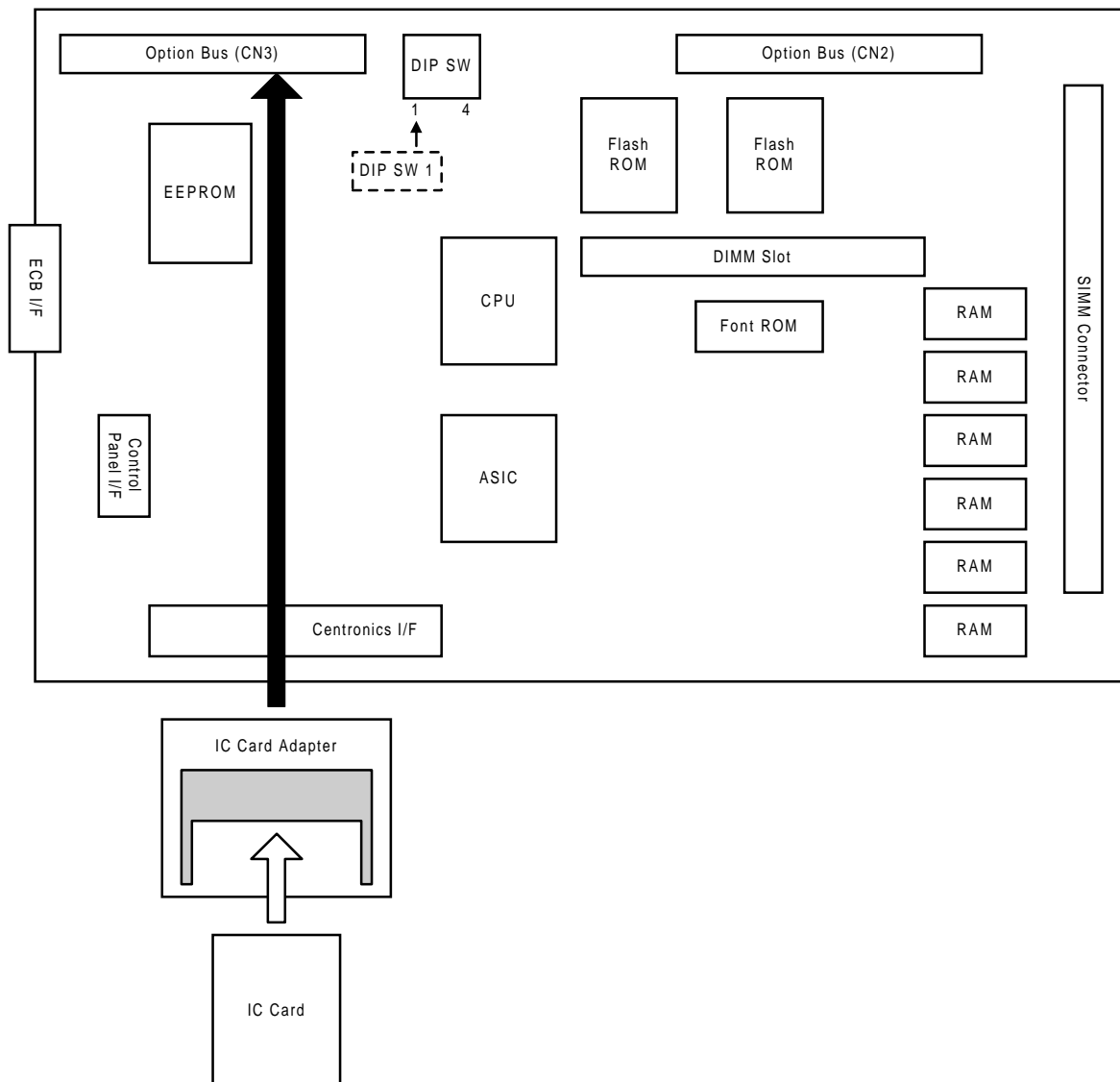
## 4.5.2 DOWNLOADING NEW FIRMWARE FROM AN IC CARD

### *Preparation*

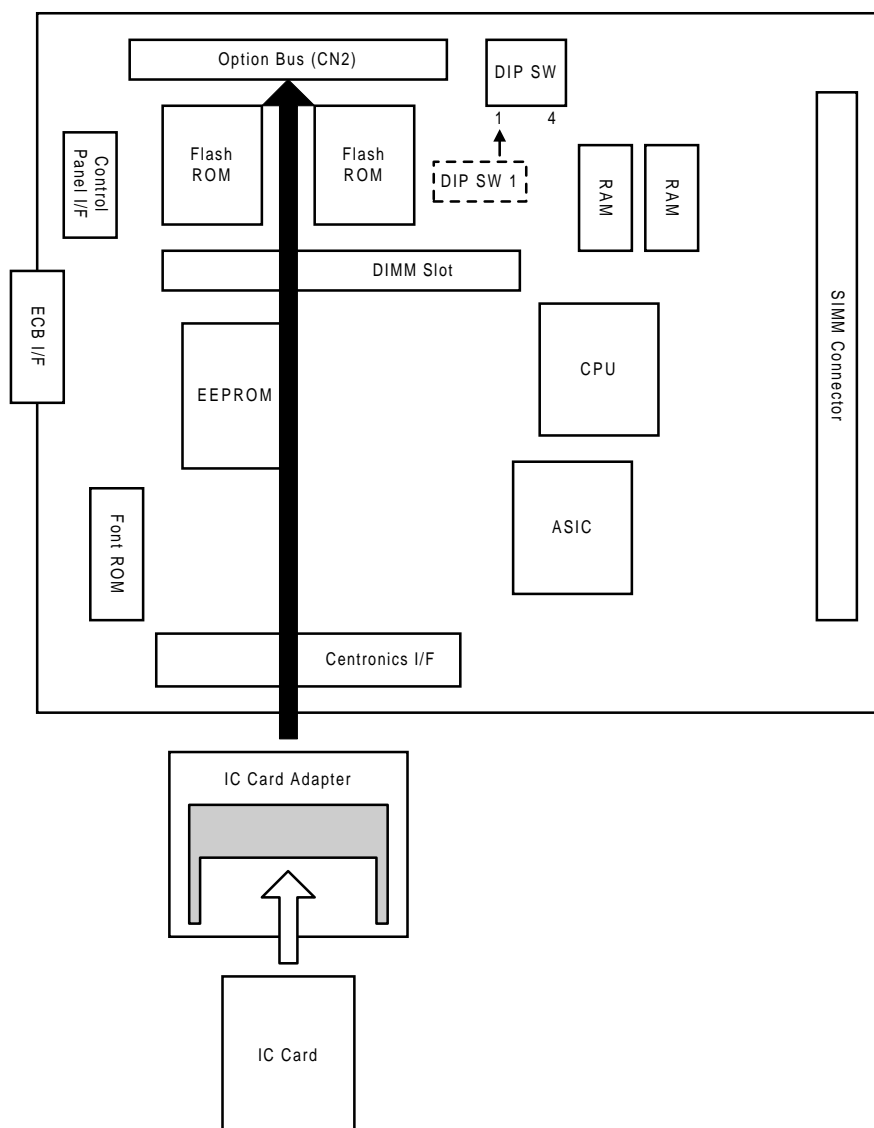
- IC card containing new firmware
- IC card adapter

### *Connecting the IC Card*

**G031**



G032



### Downloading Procedure

1. Turn off the printer.
2. Change DIP SW1 to ON on the printer control board.
3. Attach the IC card to the IC card adapter, then plug the adapter into the option bus connector.  
**NOTE:** G031 has two option bus connectors. Only the connector on the left side can be used for downloading.
4. Turn on the printer. The printer will boot from the firmware in the IC card.  
**NOTE:** Don't use a blank IC card. Otherwise the printer will not boot up.

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5. The service menu will appear as follows. Do the following step by step.

Stinger Service  
1. Update Firm

**NOTE:** The term “Stinger” indicates either the G032 or G032 printer.

Press the “Enter” key.

1. Update Firm  
Sure?

Press the “Form Feed” key.

Stinger Firm ver  
Wait 62

The counter on the display counts down to zero.

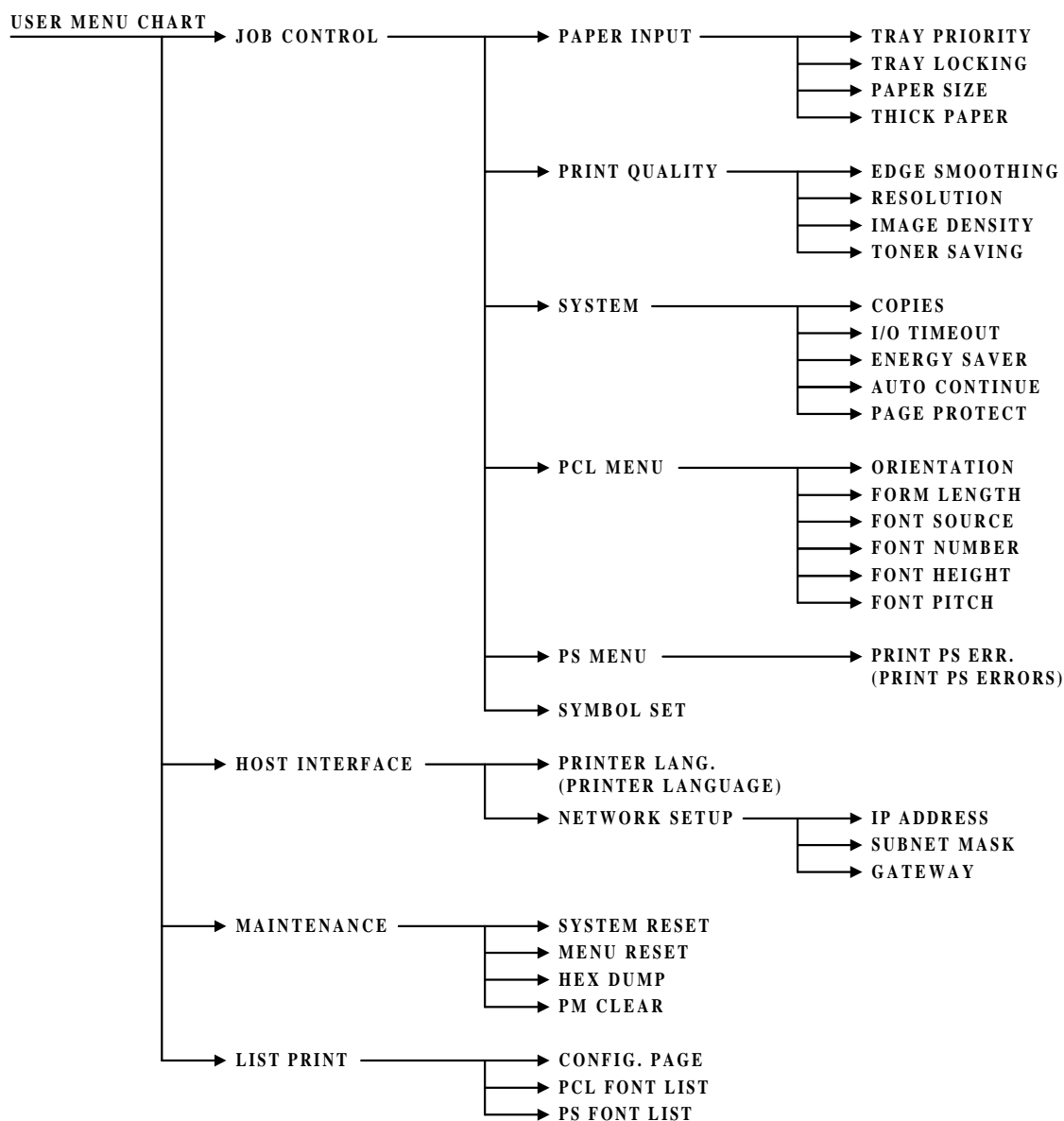
Stinger Firm ver  
Successful

6. The above display shows that updating has finished.
7. Turn off the printer.
8. Detach the IC card and the IC card adapter.
9. Change DIP SW1 to off.
10. Turn the printer on and enter the service program mode.
11. Print the log print and check the controller firmware version.
12. Return to the user mode.

**NOTE:** There are two ways to go back to the user mode from the service mode.

- 1) Press the “Form Feed” key and the “Escape” key together. Then initialization will start.
- 2) Turn the printer off and on.
- 3) If an error occurs, after initializing the printer for the first time after a firmware update, it may be necessary to perform the update again.

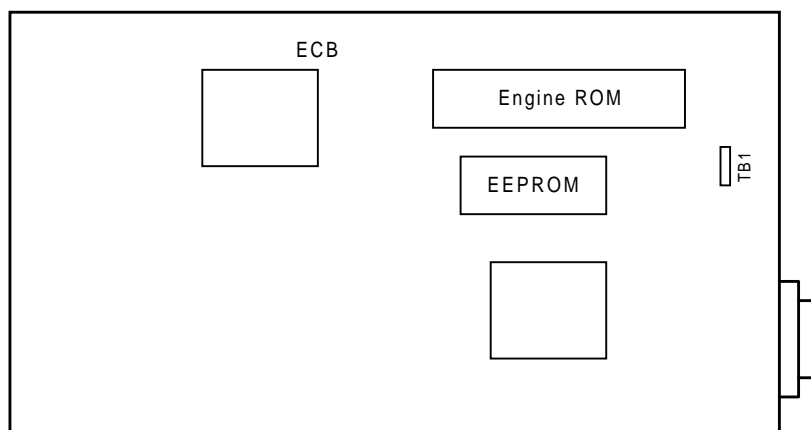
## 4.6 USER MENU



## 4.7 ECB TEST PATTERN

When the TB1 pins on the ECB board are shorted, the lattice test pattern is printed out from the ECB board. This test pattern does not use the printer control board. This test helps to find whether the problem is caused by the ECB or the printer control board.

The location of TB1 is as shown below.



### ***Procedure***

1. Turn the printer on.
2. Short the TB1 pins.
3. The test pattern is automatically printed out.

## 4.8 DIAGNOSTIC TEST MODES

### 4.8.1 OVERVIEW

This machine has two types of diagnostic test mode.

- Power-up diagnostics: Done every time the machine is switched on
- Detailed diagnostics: Done after entering the detailed diagnostic mode

### 4.8.2 POWER-UP DIAGNOSTIC MODE

This is automatically done to check system integrity whenever the machine is powered up.

If the Power LED blinks during this test, the test is proceeding without problems.

If the Power LED does not blink during the test, it means that a fatal error has occurred. If the machine detects an error, the machine displays an SC code (e.g. SC 2100) on the operation panel, turns off the Power LED, blinks the Error LED, and stops system booting.

If the error is for an optional device (if one of the following SCs is displayed), switch off the power, disconnect the defective optional device, then turn the power back on. The machine will restart.

SC Code	Optional Device
SC2600	HDD
SC2700	NIB
SC2800	DIMM
SC2900	RS232C
SC3100	SIMM
SC3200	Unknown Option
SC3201	Unknown Option

### 4.8.3 DETAILED DIAGNOSTIC MODE

#### ***Entering Detailed Diagnostic Mode***

To enter this mode, turn the machine off and on while pressing the “On Line” key and the “Enter” key together.

#### ***During the Test***

While testing, the machine displays the component being tested.

If the Power LED blinks, the test is proceeding without problems.

If the Power LED does not blink, a fatal error has occurred. If the machine has detected an error, the machine displays the error code (e.g. 0101) on the operation panel, turns off the Power LED, blinks the Error LED, and stops the test.

If an error occurs during the test, press the “Escape” key and the “Form Feed” key together to continue the test. However, if the error is one of those in the ‘Power-up and Detailed Diagnostics Modes – Program Execution Errors’ table (see section 7, ‘Troubleshooting’), the test cannot continue.

If the Centronics or RS232C loopback connector is not plugged in, an error will occur for the device with the missing connector

#### ***Print Log Output***

The print log is printed automatically after the detailed diagnostic test has finished.



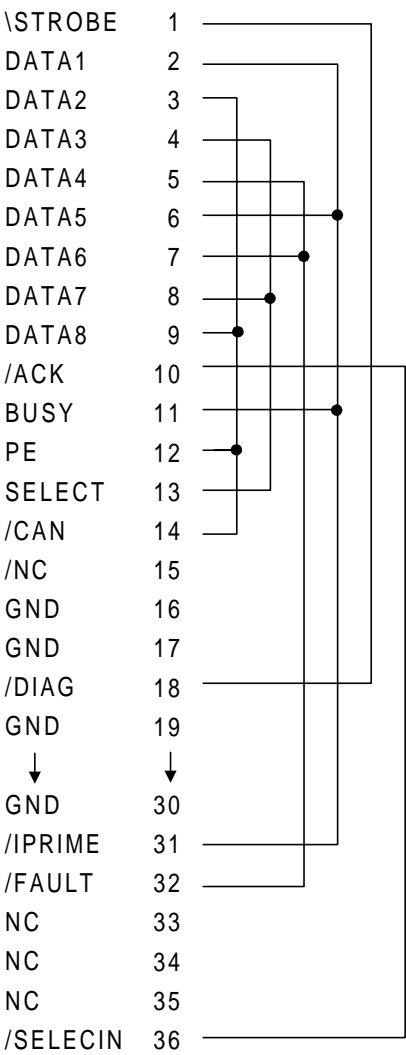
#### 4.8.4 DIAGNOSTIC TEST DETAILS

Item	Mode		Function
	Normal	Detail	
Always executed			
VR4300 (CPU) Timer	✓	✓	Tests the timer of the CPU
Code ROM	✓	✓	Tests the code ROM
Resident DRAM	✓	✓	Tests the resident DRAM
VR4300 Exception	✓	✓	Tests the exception interrupt function of the CPU
VR4300 Cache	✓	✓	Tests the cache memory of the CPU
VR4300 FPU	✓	✓	Teats the FPU of the CPU
ASIC Timer	✓	✓	Tests the timer of the ASIC
NVRAM	✓	✓	Tests the NVRAM
ASIC P1284	✗	✓	Tests the parallel interface (IEEE1284)
ASIC Engine I/F	✓	✓	Tests the engine control board I/F of the ASIC
Font ROM	✓	✓	Tests the font ROM
ASIC PVDMA	✓	✓	Tests the PVDMA of the ASIC
Executed if they are installed			
Optional SIMM	✓	✓	Tests the SIMM
HDD	✓	✓	Tests the HDD
NIB	✓	✓	Tests the NIB
RS232C Loopback Test	✓	✓	Makes a serial interface loopback test (RS232C)

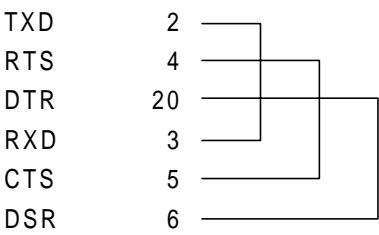
The option tests are executed only if these devices are detected.

The parallel and the RS232C loopback tests require the loopback connectors to be connected. If these connectors are not attached, the tests for these components will result in an error.

**Loopback Connector for the Centronics Interface**



**Loopback Connector for the RS232C Interface**



## 4.9 FIRMWARE HISTORY

### 4.9.1 G031 CONTROLLER FIRMWARE MODIFICATION HISTORY

G031 CONTROLLER FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
Initial Production	G0315915 <b>E</b>	1st Mass Production	1.05
<ul style="list-style-type: none"> <li>HDD and Serial Port functions have been added (Phase 2).</li> </ul>	G0315915 <b>G</b>	June 1999 Production	2.01
<ul style="list-style-type: none"> <li>Wrinkling at 1200 dpi.</li> <li>When the print job starts, while displaying "Tray x add paper", Aficio Manager displays "Paper out".</li> </ul>	G0315915 <b>K</b>	August 1999 Production	2.03
<ul style="list-style-type: none"> <li>The Font Download function has been added.</li> <li>The paper size signal from AS400 cannot be recognized properly.</li> <li>The engine firmware version is not printed on the Configuration sheet correctly.</li> </ul>	G0315915 <b>L</b>	Prod. Discontinued	2.05
<ul style="list-style-type: none"> <li>The right edge is not printed.</li> <li>Print error after alternately printing Unix file → Windows PS file → Unix file.</li> </ul>	G0315915 <b>N</b>	Prod. Discontinued	2.07
<ul style="list-style-type: none"> <li>Printing stalls when using PS driver under Windows XP.</li> </ul>	G0315915 <b>P</b>	Prod. Discontinued	2.08
<ul style="list-style-type: none"> <li>Printer option now supports Mac OS X version 10.1 (Native) and newer.</li> </ul>	G0315915 <b>Q</b>	Prod. Discontinued	2.09



**4.9.2 G032 CONTROLLER FIRMWARE MODIFICATION HISTORY**

<b>G032 CONTROLLER FIRMWARE MODIFICATION HISTORY</b>			
<b>DESCRIPTION OF MODIFICATION</b>	<b>FIRMWARE LEVEL</b>	<b>SERIAL NUMBER</b>	<b>FIRMWARE VERSION</b>
Initial Production	G0325915 <b>E</b>	1st Mass Production	1.05
<ul style="list-style-type: none"> <li>HDD and Serial Port functions have been added (Phase 2).</li> <li>The printing job does not restart when the paper is added into the standard tray after interrupting the job by the paper end.</li> </ul>	G0325915 <b>G</b>	June 1999 Production	2.01
<ul style="list-style-type: none"> <li>Wrinkling at 1200 dpi.</li> <li>When the print job starts, while displaying "Tray x add paper", Aficio Manager displays "Paper out".</li> </ul>	G0325915 <b>K</b>	August 1999 Production	2.03
<ul style="list-style-type: none"> <li>The Font Download function has been added.</li> <li>The paper size signal from AS400 cannot be recognized properly.</li> <li>The engine firmware version is not printed on the Configuration sheet correctly.</li> </ul>	G0325915 <b>L</b>	Prod. Discontinued	2.05
<ul style="list-style-type: none"> <li>The right edge is not printed.</li> <li>Print error after alternately printing Unix file → Windows PS file → Unix file.</li> </ul>	G0325915 <b>N</b>	Prod. Discontinued	2.07
<ul style="list-style-type: none"> <li>Printing stalls when using PS driver under Windows XP.</li> </ul>	G0325915 <b>P</b>	Prod. Discontinued	2.08
<ul style="list-style-type: none"> <li>Printer option now supports Mac OS X version 10.1 (Native) and newer.</li> </ul>	G0325915 <b>Q</b>	Prod. Discontinued	2.09



# **PREVENTIVE MAINTENANCE**

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

## 5. PREVENTIVE MAINTENANCE

### 5.1 PREVENTIVE MAINTENANCE SCHEDULE

All PM will be done by the user. A maintenance kit is available for the user.

The maintenance kit contains the following items.

- Fusing Unit
- Transfer Roller
- Paper Feed Roller (3 pcs for the G031, 1 pc for the G032)
- Friction Pad

When the maintenance counter reaches 80 for the G031 and 60 for the G032, "REPLACE MAINTENANCE KIT" is displayed.

After replacing the parts in the maintenance kit for the G032, PM clear in the user's maintenance menu is required to reset the display. This is not needed for the G031, because the G031 automatically resets the display when it detects the new fusing unit.

Symbol key: C: Clean, R: Replace, L: Lubricate, I: Inspect

Item	PM		EM	Remarks
	G031 80	G032 60		
Main Frame				
Fusing Unit	R	R		
Transfer Roller	R	R		
Paper Feed Roller	R	R	C	Clean with water
Friction Pad	R	R	C	Clean with water
Registration Roller (G031)			C	Clean with water
Shield Glass			C	Clean with water
Bypass Tray Paper Feed Roller			C	Clean with water
Bypass Tray Friction Pad			C	Clean with water
Relay Roller (G032)			C	Clean with water
Paper Feed Unit				
Paper Feed Roller	R		C	Clean with water
Friction Pad			C	Clean with water
Drive Roller			C	Clean with water

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA



# **REPLACEMENT AND ADJUSTMENT**

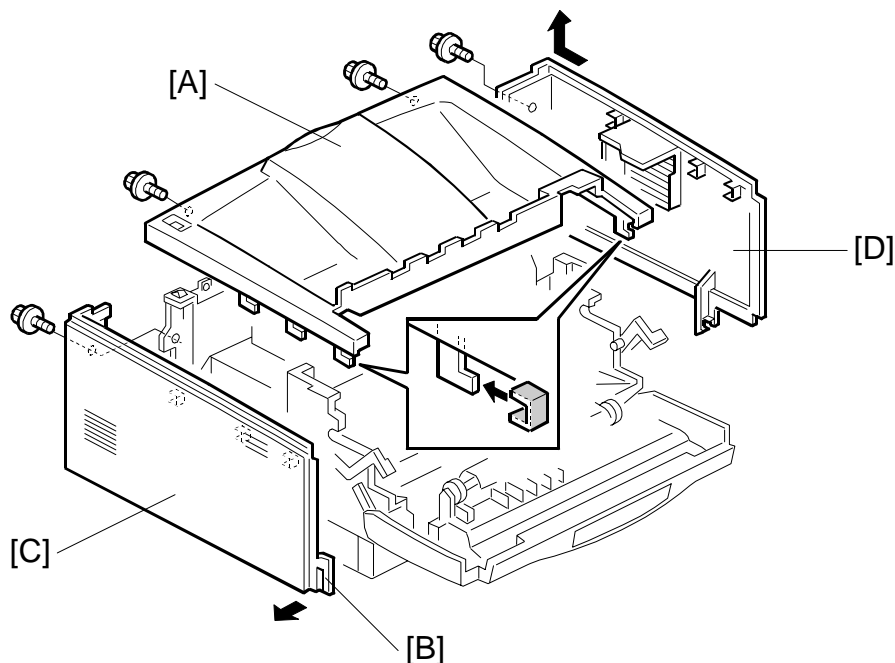
CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

## 6. REPLACEMENT AND ADJUSTMENT

### 6.1 COVERS

#### 6.1.1 EXTERIOR COVER REMOVAL



#### **G031**

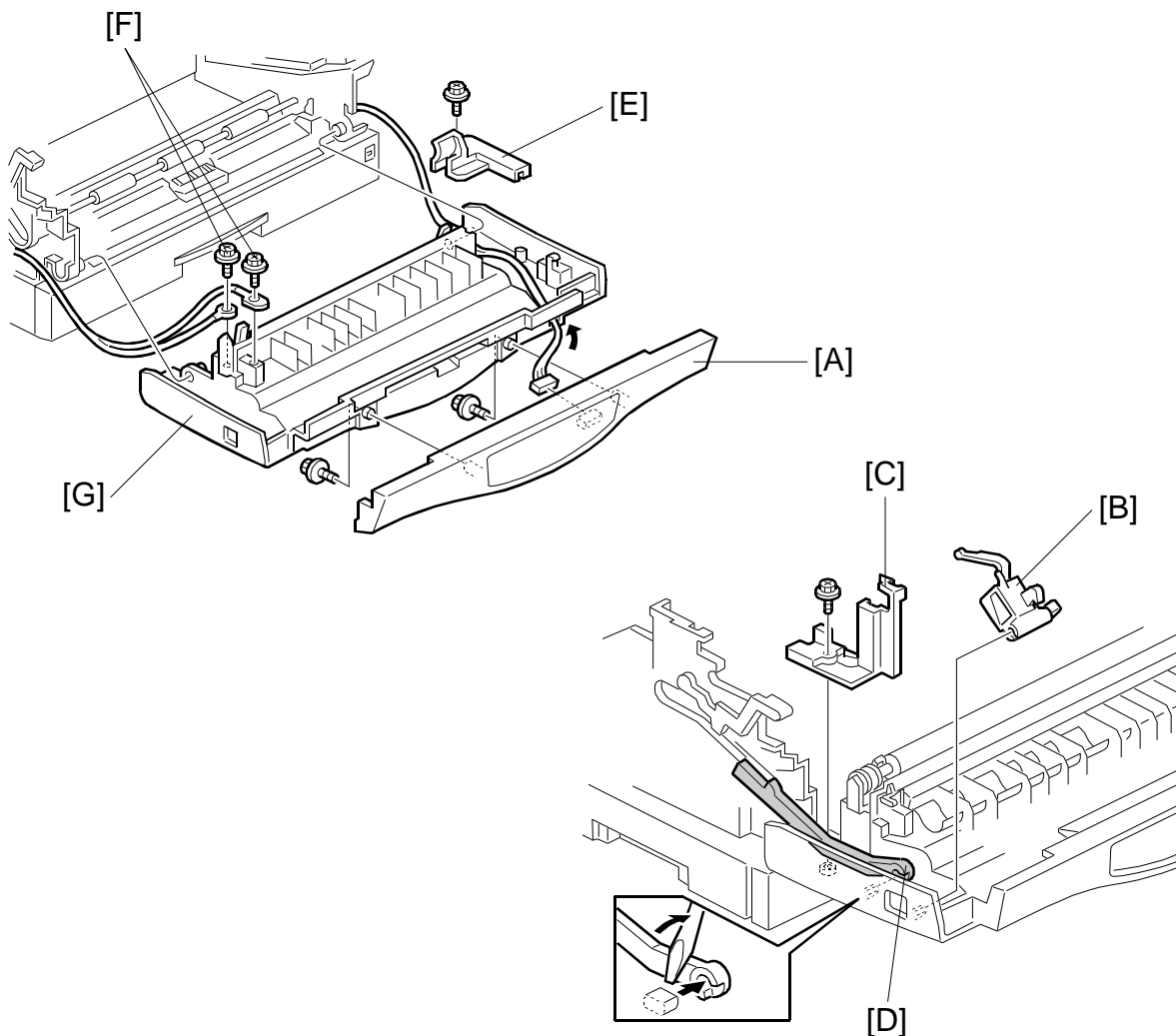
1. Remove the fusing unit. (Refer to Fusing Unit Replacement, section 6.2.1.)
2. Remove the top cover [A] (two screws).
3. Pull the hook [B] towards the outside, then remove the left cover [C] (1 screw).
4. Slightly shift the right cover [D] towards the rear, then remove it (1 screw).

#### **G032**

**NOTE:** Before removing the exterior covers, remove the printer from the paper feed unit (if the optional paper feed unit is installed).

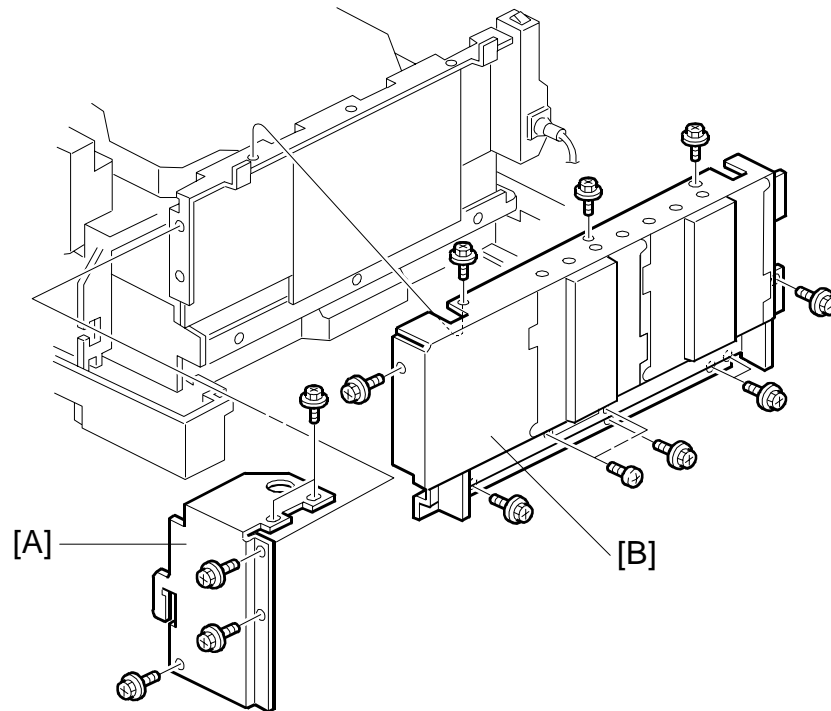
1. Remove the fusing unit. (Refer to Fusing Unit Replacement, section 6.2.1.)
2. Remove the top cover [A] (two screws).
3. Slightly pull out the paper tray.
4. Remove the left and right covers [B, D] (1 screw each).

## COVERS

**6.1.2 FRONT COVER REMOVAL**

1. Remove the by-pass tray. (Refer to By-pass Tray Removal, section 6.4.1.)
2. Open the front cover.
3. Remove the operation panel [A] (2 screws and 1 connector).
4. Remove the lock lever [B].
5. Remove the cable cover [C] (1 screw).
6. Release the shutter arm [D] as shown.
7. Remove the clamp (G031, 1 screw) or cable cover [E] (G032, 1 screw).
8. Remove the two screws [F] securing the cables.
9. Remove the front cover [G].

### 6.1.3 CONTROL BOARD COVER REMOVAL



1. Remove the top, left and right covers. (Refer to Exterior Cover Removal, section 6.1.1.)
2. Remove the shielding plate [A] (5 screws, G031 only).
3. Remove the control board cover [B] (11 screws).

Replacement  
and  
Adjustment

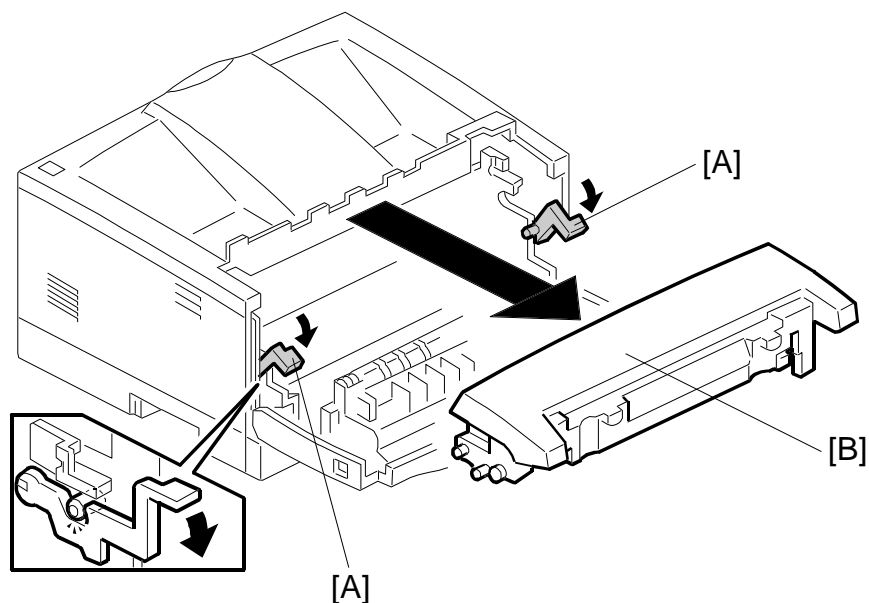
## FUSING UNIT

## 6.2 FUSING UNIT

### 6.2.1 FUSING UNIT REPLACEMENT

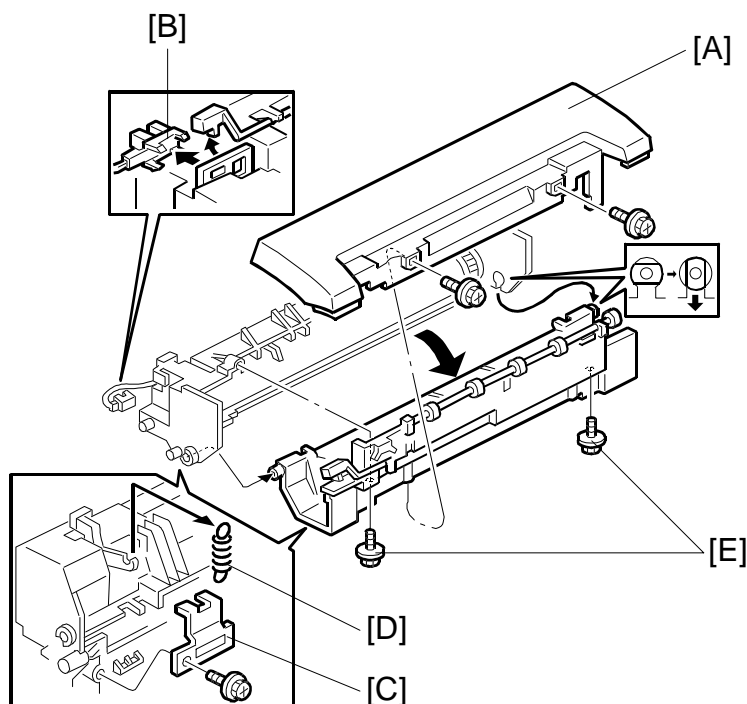
**⚠ CAUTION**

Be careful when removing the fusing unit, because it could be very hot.



1. Turn off the main switch.
2. Open the front cover.
3. Release the levers [A] as shown.
4. Replace the fusing unit [B].
5. Perform the PM clear (except after installing the fusing unit in the G031 maintenance kit).
  - User Menu – Maintenance – PM Clear

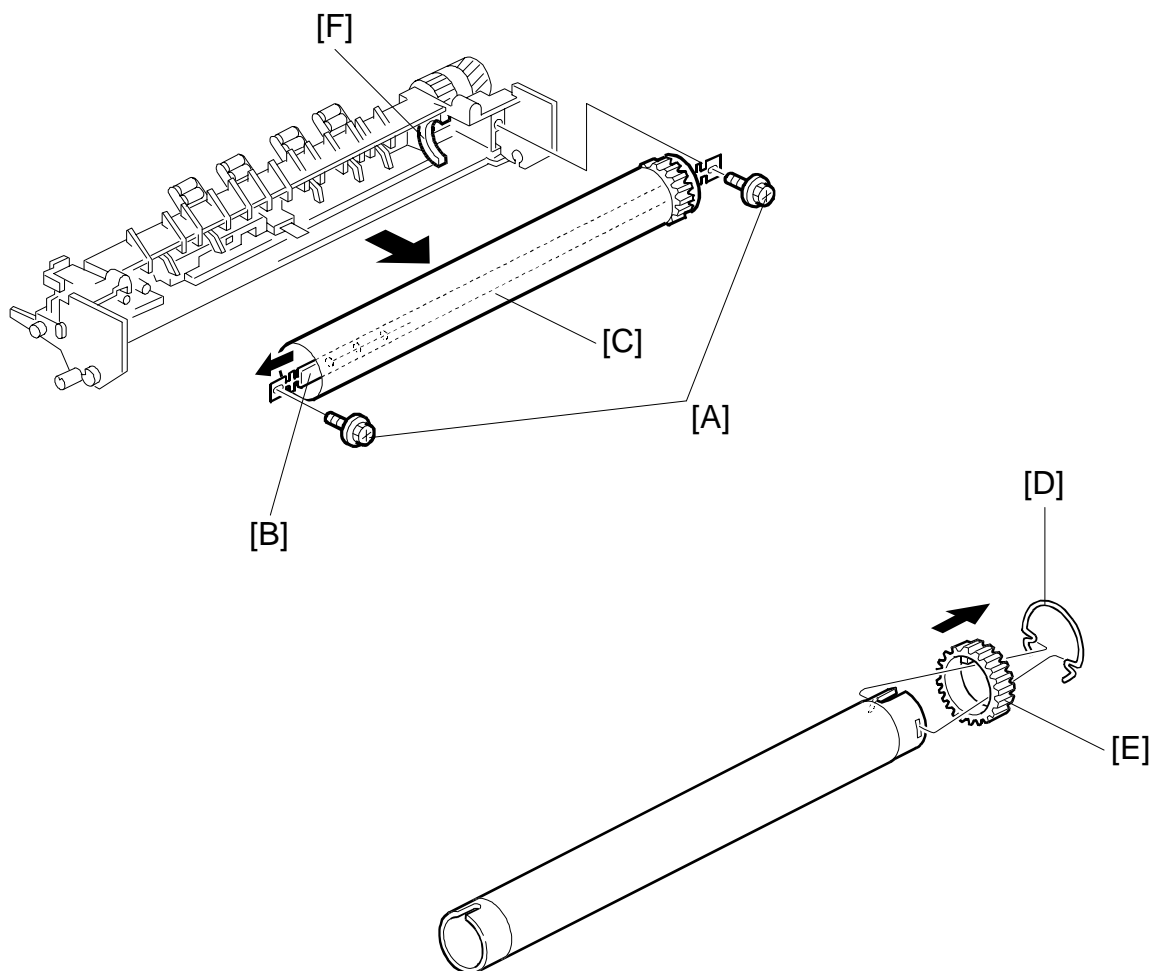
## 6.2.2 HOT ROLLER AND FUSING LAMP REPLACEMENT



1. Remove the fusing unit. (Refer to Fusing Unit Replacement, section 6.2.1.)
2. Remove the fusing cover [A] (2 screws).
3. Remove the fusing exit sensor [B].
4. Remove the bracket [C] and the spring [D]. (G031 has two brackets [C] and two springs [D], G032 has one of each.)
5. Separate the fusing unit (2 screws [E]).

Replacement  
and  
Adjustment

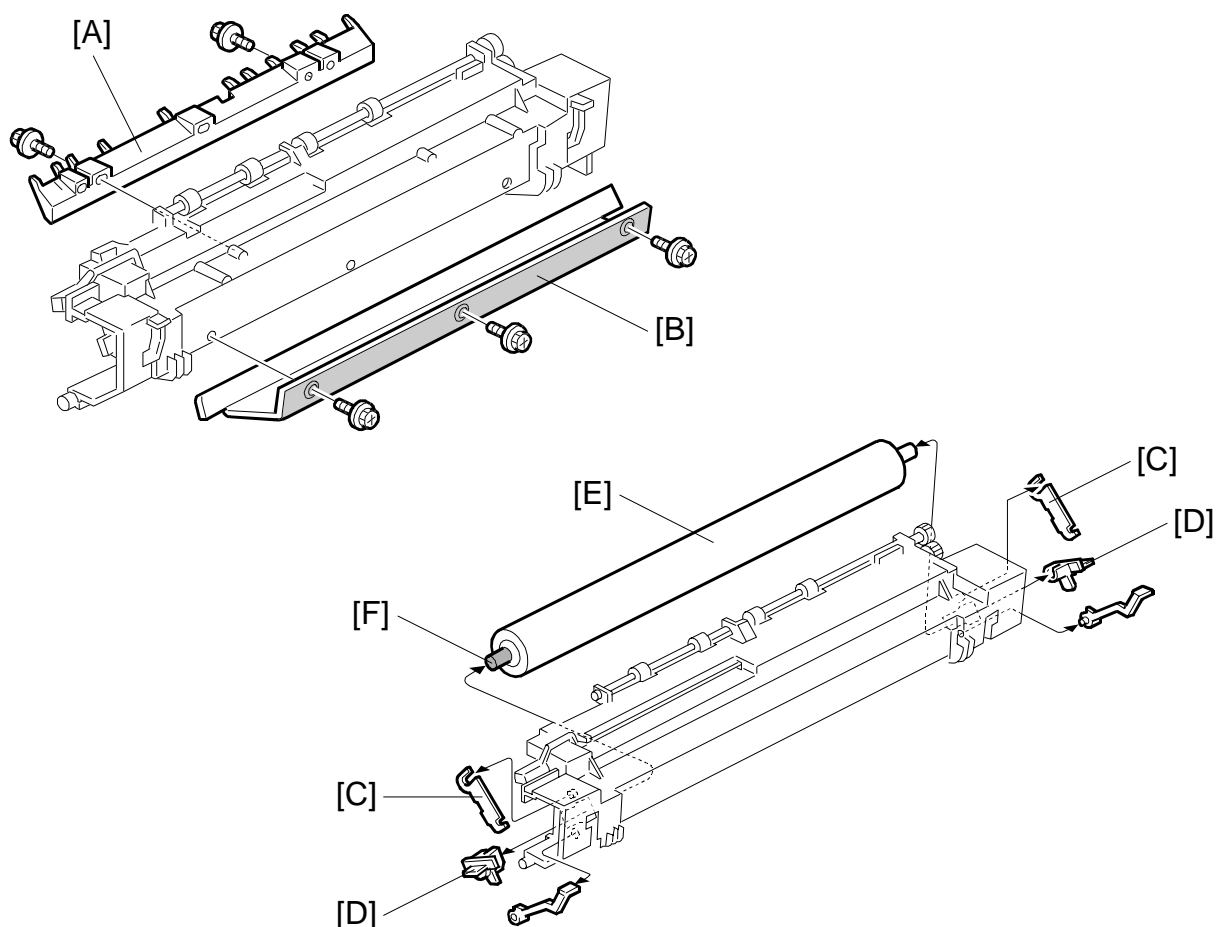
## FUSING UNIT



6. Remove the two screws [A] securing the terminals.
7. Replace the fusing lamp [B].  
**NOTE:** Do not touch the fusing lamp with your bare hands.
8. Replace the hot roller [C] (1 C-ring [D] and 1 gear [E]).  
**NOTE:** 1) Be careful not to scratch the hot roller with the stripper pawls.  
2) Do not touch the hot roller with your bare hands.  
3) When re-installing the hot roller, make sure that the bushing [F] is in the correct place, as shown.



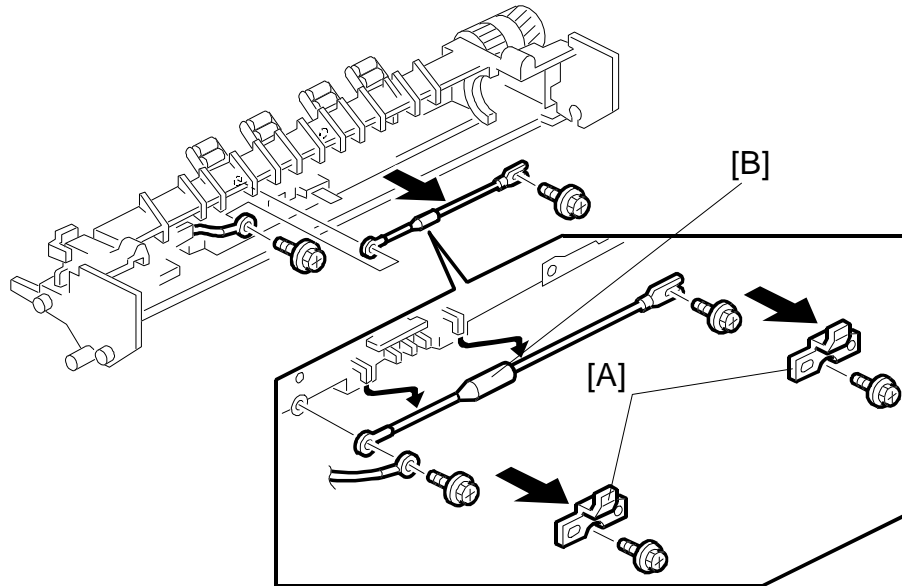
### 6.2.3 PRESSURE ROLLER REPLACEMENT



1. Perform steps 1 to 5 of Hot Roller and Fusing Lamp Replacement, section 6.2.2.
2. G031 only: Remove the exit guide plate [A] (2 screws).
3. G031 only: Remove the entrance guide [B] (3 screws).
4. Remove the pressure arms [C].
5. Remove the bushings [D].
6. Replace the pressure roller [E].

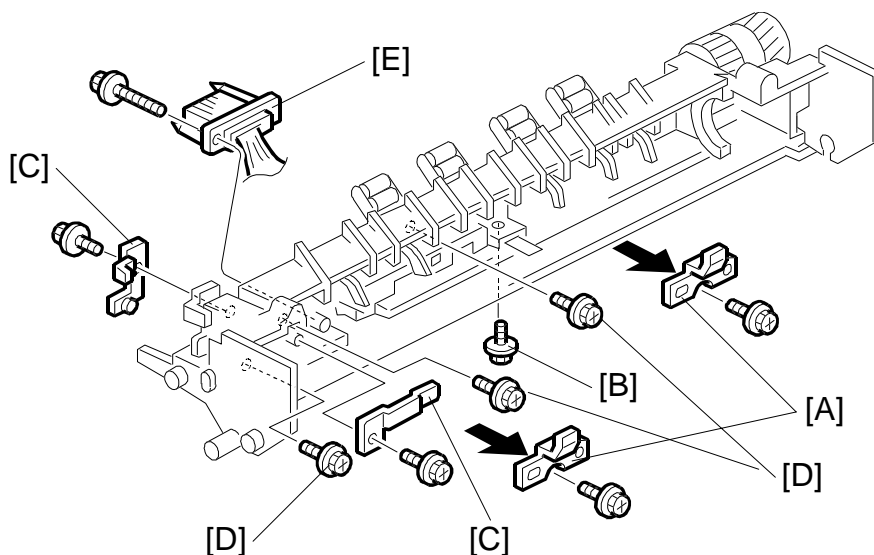
**NOTE:** 1) When re-installing the pressure roller, make sure that the green pin [F] is at the left side, as shown (near the fusing exit sensor).  
 2) Do not touch the pressure roller with your bare hands.

## FUSING UNIT

**6.2.4 FUSING THERMOFUSE REPLACEMENT**

1. Remove the hot roller. (Refer to Hot Roller and Fusing Lamp Replacement, section 6.2.2.)
2. Remove the two screw covers [A] (230 V machine only, 1 screw each).
3. Replace the fusing thermofuse [B] (2 screws).

## 6.2.5 FUSING DRAWER CONNECTOR REPLACEMENT



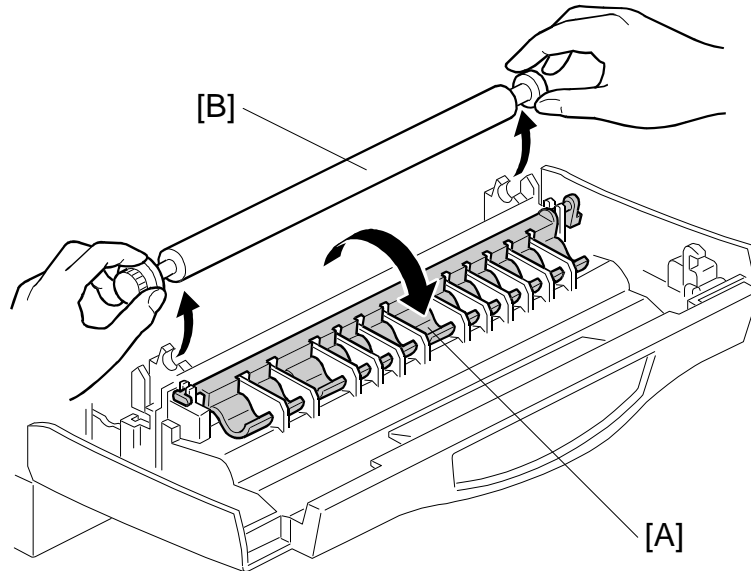
1. Remove the hot roller. (Refer to Hot Roller and Fusing Lamp Replacement, section 6.2.2.)
2. Remove the two screw covers [A] (230 V machine only, 1 screw each).
3. Remove the screw [B] securing the thermistor.
4. Remove the two cable covers [C] (1 screw each).  
**NOTE:** When re-installing the cable covers, secure the cable under the cover correctly.
5. Remove the three screws [D] securing the cable.
6. Replace the fusing drawer connector [E] (1 screw).

Replacement  
and  
Adjustment

TRANSFER ROLLER

## 6.3 TRANSFER ROLLER

### 6.3.1 TRANSFER ROLLER REPLACEMENT



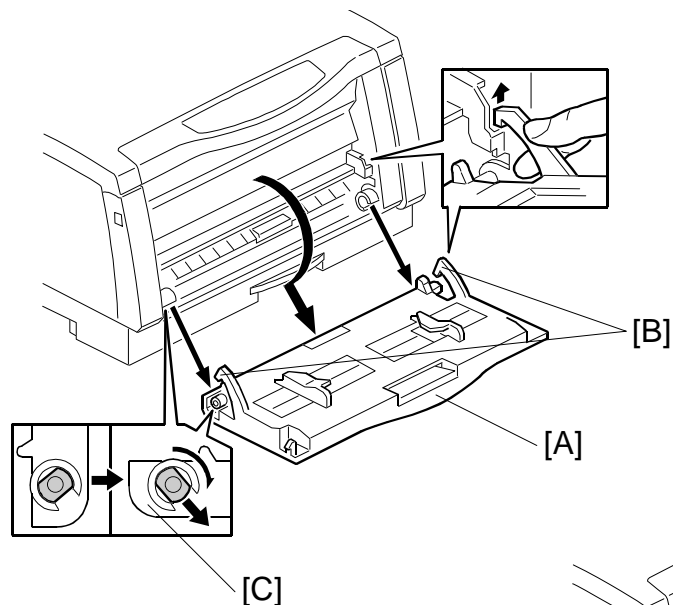
1. Open the front cover.
2. Open the transfer roller cover [A].
3. Replace the transfer roller [B].

**NOTE:** Do not touch the transfer roller with your bare hands.

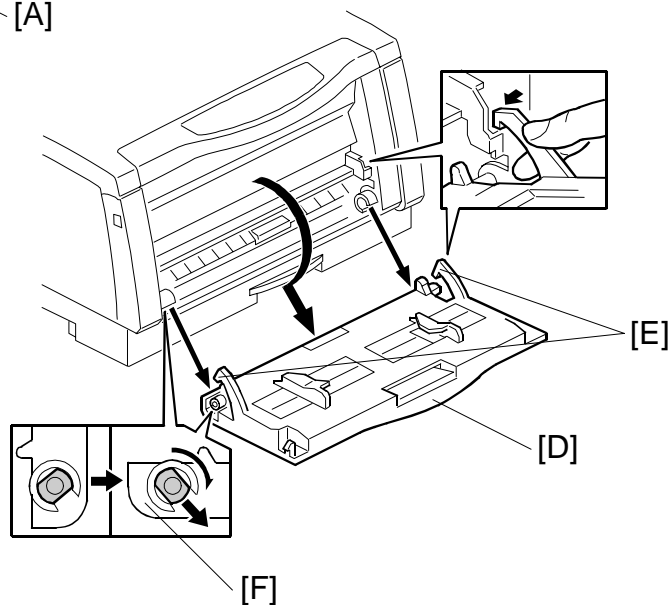
## 6.4 PAPER FEED

### 6.4.1 BY-PASS TRAY REMOVAL

#### - G031



#### - G032 -



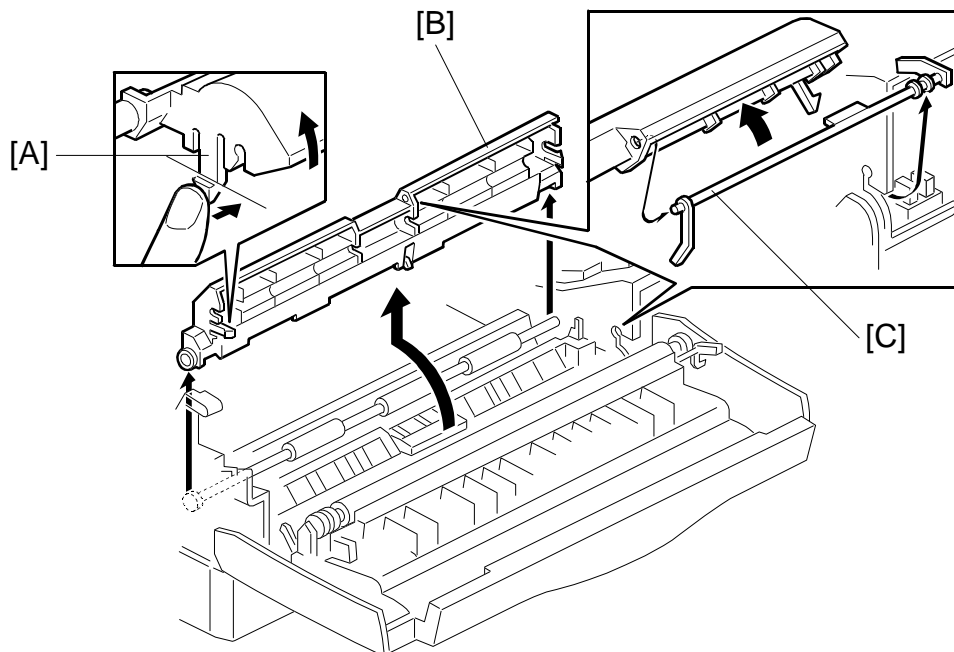
#### **G031**

1. Open the by-pass tray [A].
2. While lifting the hooks [B], lower the by-pass tray and remove it as shown [C].

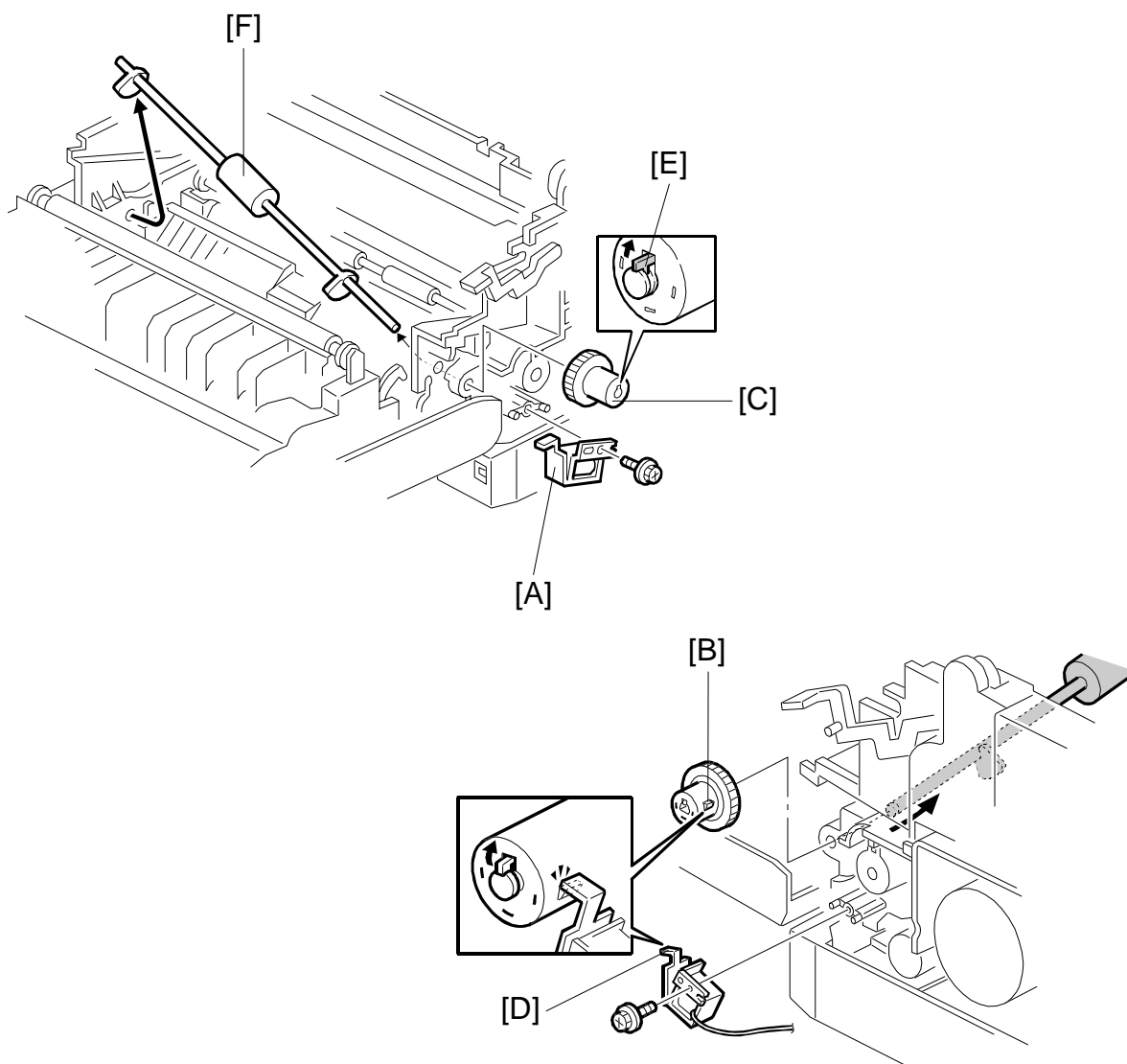
#### **G032**

1. Open the by-pass tray [D].
2. Draw out the paper cassette.
3. While moving the hooks [E] inwards, lower the by-pass tray and remove it as shown [F].

## 6.4.2 BY-PASS FEED ROLLER REPLACEMENT

**G031**

1. Remove the right cover. (Refer to Exterior Cover Removal, section 6.1.1.)
2. While releasing the hook [A], remove the by-pass feed roller cover [B], as shown.  
**NOTE:** Remove the by-pass feed roller cover carefully (it is attached tightly). Otherwise, the feeler [C] may be damaged.
3. Remove the feeler [C].



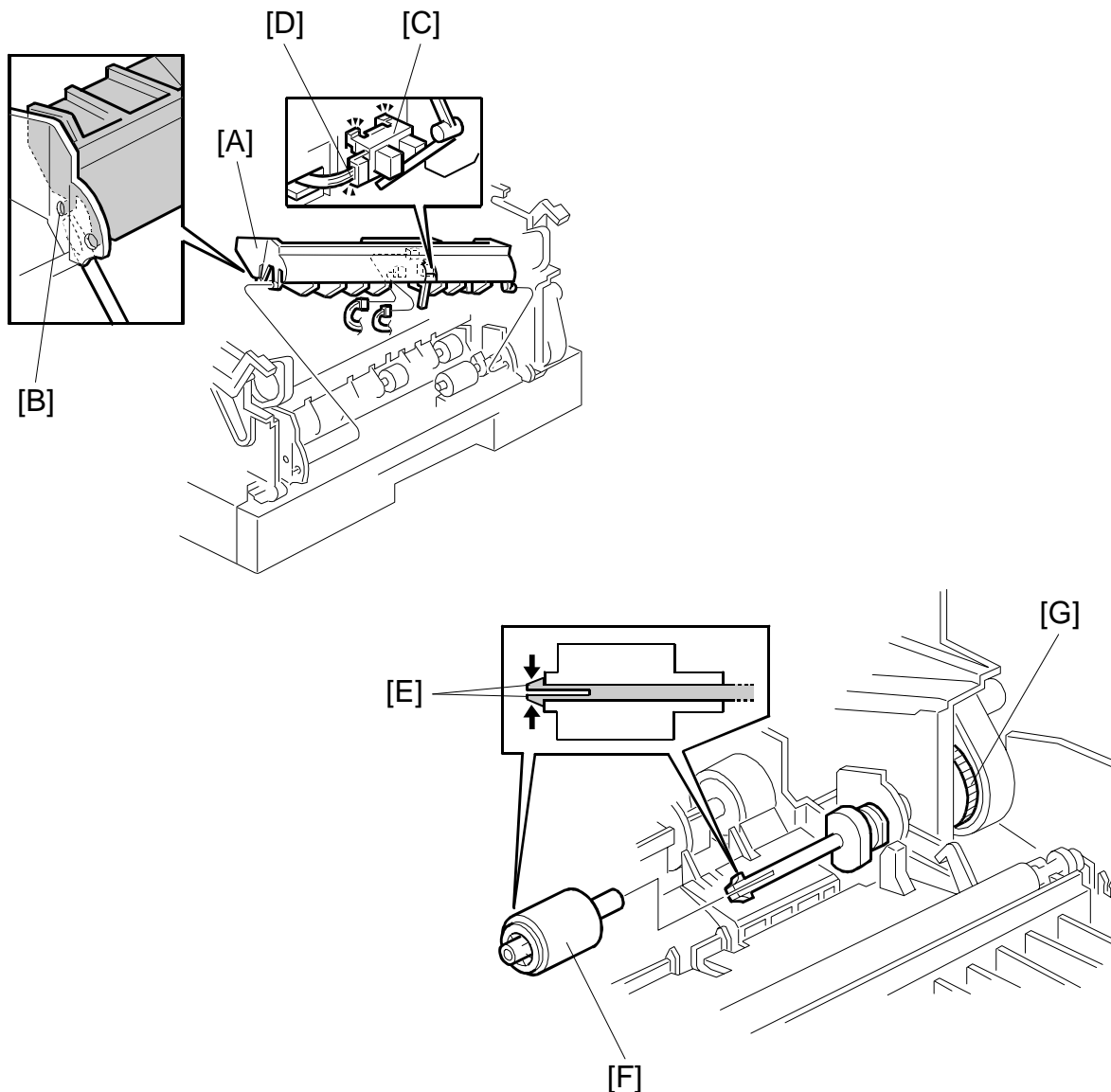
4. Remove the by-pass feed solenoid [A] (1 screw).

**NOTE:** When reinstalling the by-pass feed solenoid, make sure that the projection [B] on the by-pass feed clutch [C] touches the underside of the bracket [D].

5. While unhooking the hook [E] from the by-pass feed clutch, remove the by-pass feed roller [F], as shown.

**NOTE:** Do not touch the by-pass feed roller with your bare hands.

## PAPER FEED

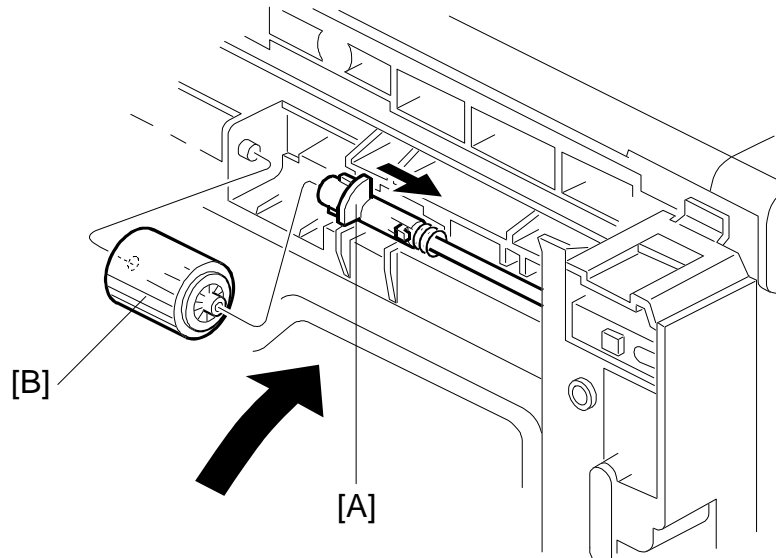
**G032**

1. Remove the front cover. (Refer to Front Cover Removal, section 6.1.2.)
2. Remove the by-pass feed roller cover [A], as shown.  
**NOTE:** 1) First, unhook the left rear hook [B].  
 2) When re-installing the by-pass feed roller cover, make sure that the sensor [C] and connector [D] are connected together and attached to the frame, as shown.
3. While unhooking the hooks [E], remove the by-pass feed roller [F], as shown.  
**NOTE:** 1) Do not touch the by-pass feed roller with your bare hands.  
 2) While pushing the gear [G] towards the inside of the machine, re-install the by-pass feed roller.



### 6.4.3 PAPER FEED ROLLER REPLACEMENT

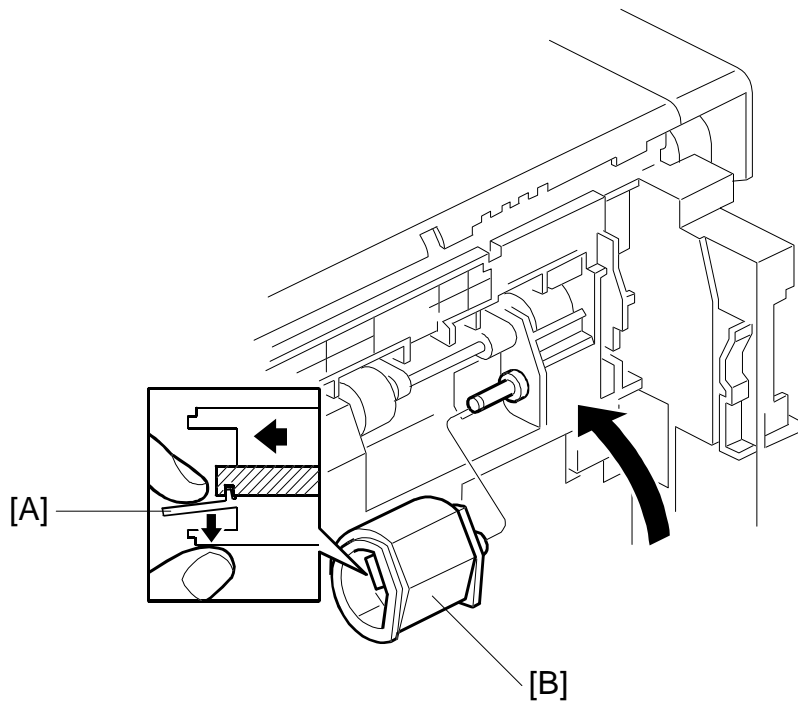
**G031**



1. Draw out the paper cassette.
2. While releasing the spring mechanism [A], remove the paper feed roller [B].  
**NOTE:** Do not touch the paper feed roller with your bare hands.

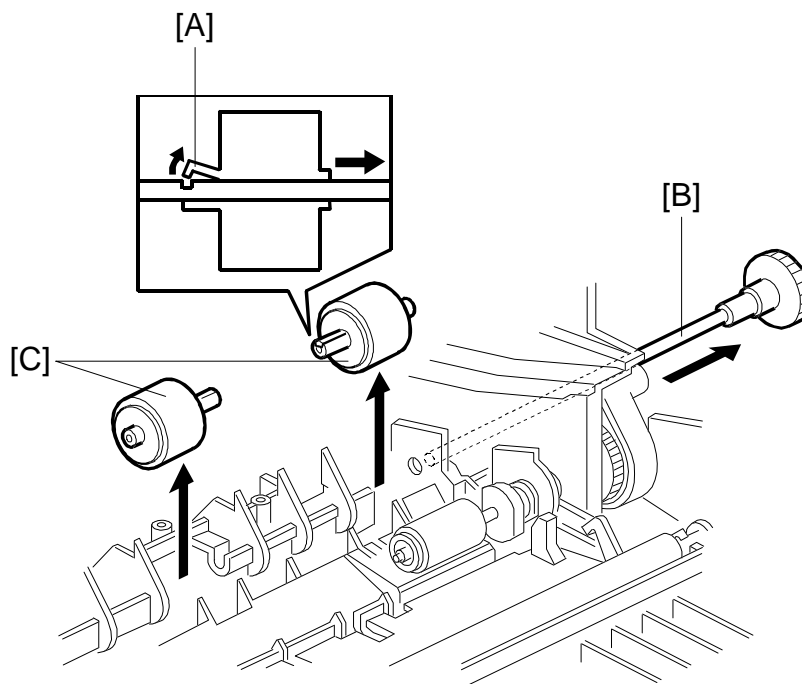
Replacement  
and  
Adjustment

## PAPER FEED

**G032**

1. Draw out the paper cassette.
2. While releasing the hook [A], remove the paper feed roller [B].  
**NOTE:** Do not touch the paper feed roller with your bare hands.

#### 6.4.4 RELAY ROLLER REPLACEMENT (G032 ONLY)

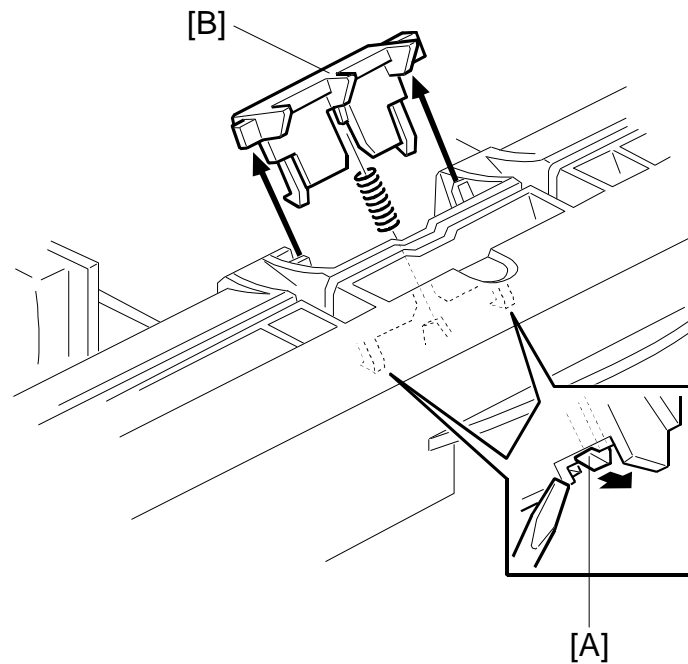


1. Remove the by-pass feed roller cover. (Refer to By-pass Feed Roller Replacement, section 6.4.2.)
2. While unhooking the hooks [A], pull the shaft [B] out to the right.
3. Replace the relay rollers [C].

**NOTE:** Do not touch the relay rollers with your bare hands.

Replacement  
and  
Adjustment

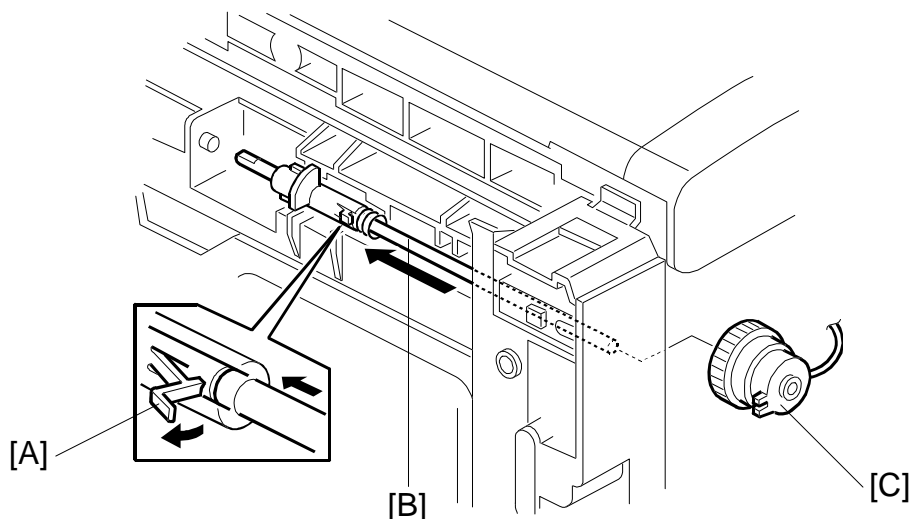
### 6.4.5 FRICTION PAD REPLACEMENT



1. Draw out the paper cassette.
2. Remove the paper from the paper tray. Turn the tray upside down and place it on a flat surface.
3. While unhooking the hooks [A], remove the friction pad [B], as shown.

**NOTE:** Be sure to unhook the hooks. Otherwise, they may be broken.

## 6.4.6 TRAY PAPER FEED CLUTCH REPLACEMENT



1. Remove the control board cover. (Refer to Control Board Cover Removal, section 6.1.3.)
2. Remove the paper feed roller. (Refer to Paper Feed Roller Replacement, section 6.4.3.)
3. While unhooking the hook [A], pull the shaft [B] out to the left.
4. Replace the tray paper feed clutch [C] (1 connector on the engine control board).

Replacement  
and  
Adjustment

## LASER UNIT

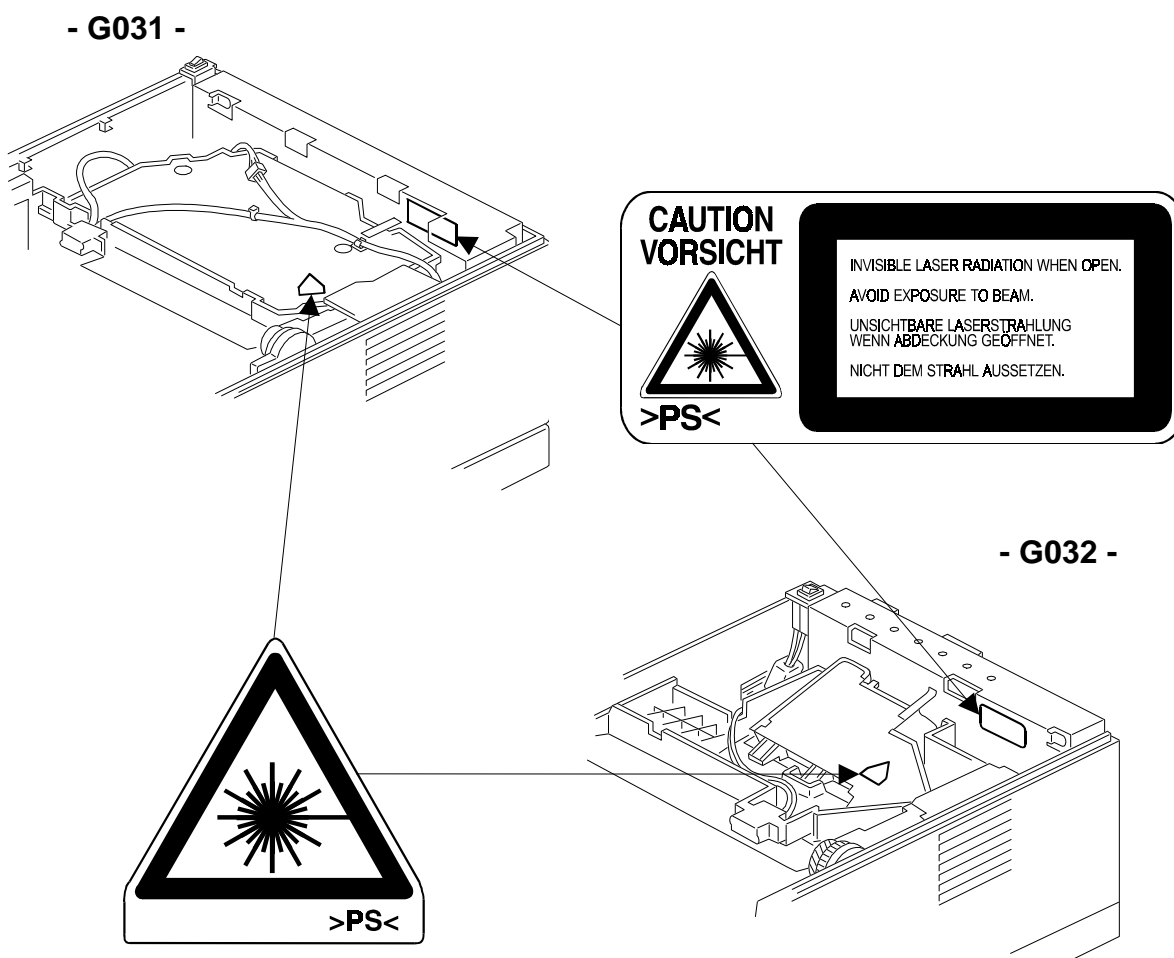
## 6.5 LASER UNIT

**⚠ WARNING**

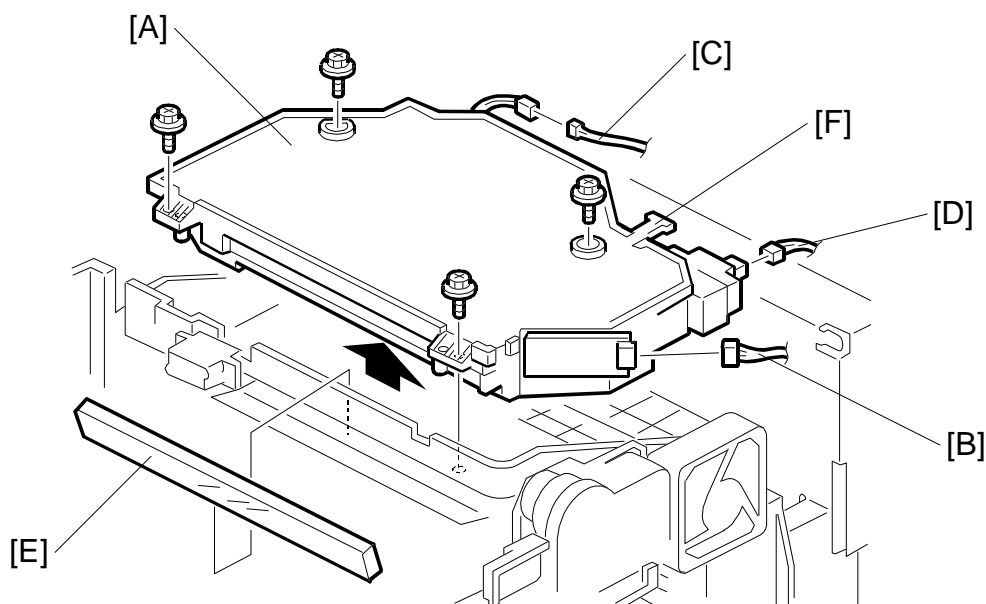
Turn off the main switch and unplug the machine before attempting any of the procedures in this section. Laser beams can seriously damage your eyes.

### 6.5.1 CAUTION DECAL LOCATIONS

Caution decals are located in the laser section as shown below.



## 6.5.2 LASER UNIT/SHIELD GLASS REPLACEMENT



### **Laser Unit**

1. Remove the top cover. (Refer to Exterior Cover Removal, section 6.1.1.)
2. Remove the laser unit [A] (4 screws and 3 connectors [G031] or 2 connector [G032]).

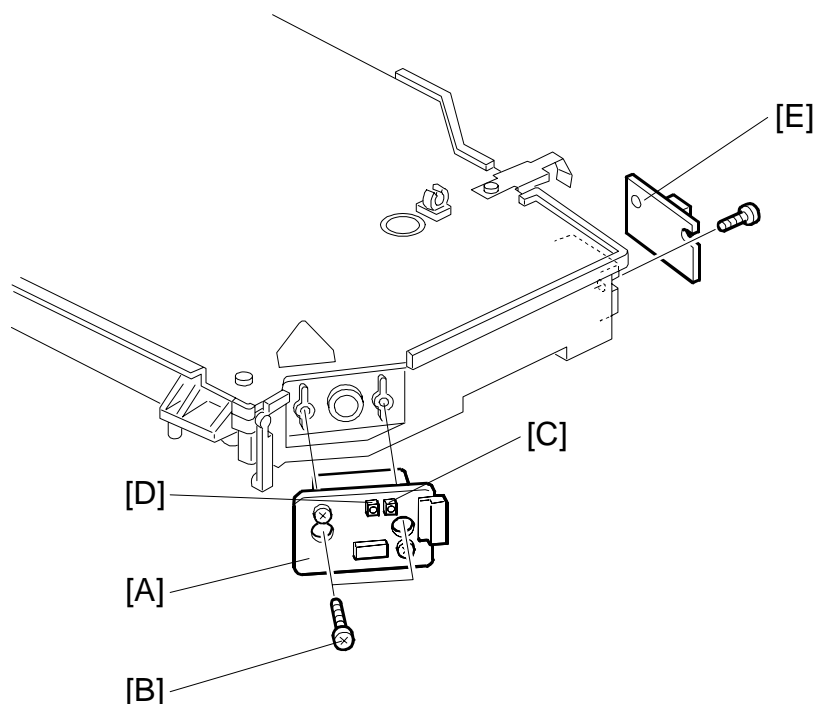
**NOTE:** 1) Disconnect connectors [B] and [C] first. When connector [D] is accessible, disconnect it.

- 2) When removing or re-installing the laser unit, make sure not to damage the shield glass [E] located just under the unit.

### **Shield Glass**

1. Remove the laser unit as described above.
2. Replace the shield glass [E].

## LASER UNIT

**6.5.3 LD UNIT/LASER SYNCHRONIZATION DETECTOR  
REPLACEMENT****G031*****LD Unit***

1. Remove the laser unit. (Refer to Laser Unit/Shield Glass Replacement, section 6.5.1.)
2. Replace the LD unit [A] by removing the screws [B] as shown.

**NOTE:** Do not touch VR101 [C] and VR102 [D], because they are adjusted in the factory before shipment.

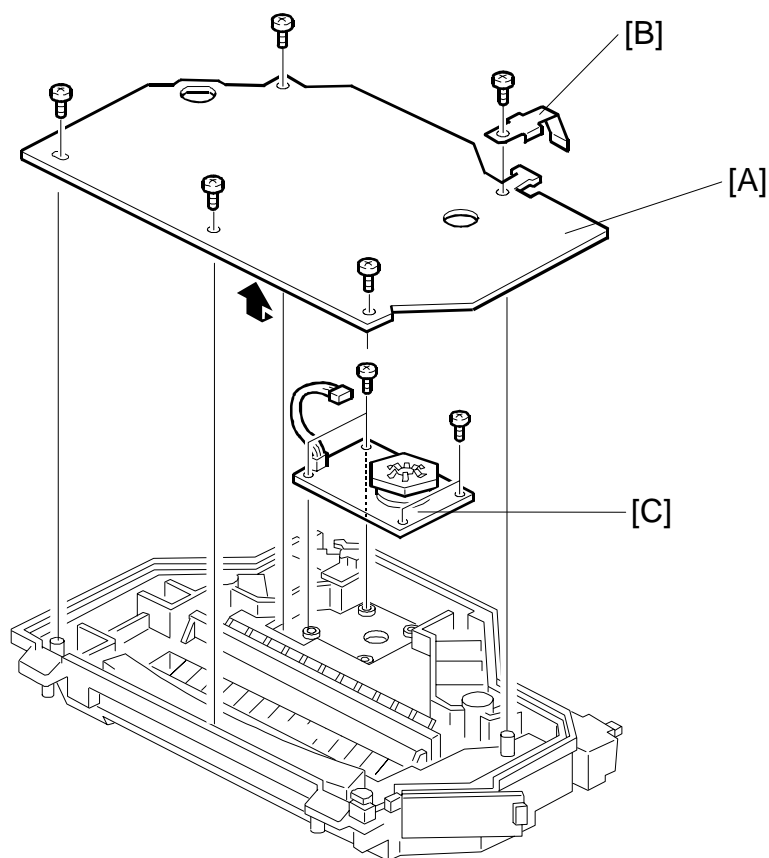
***Laser Synchronization Detector***

1. Remove the laser unit. (Refer to Laser Unit/Shield Glass Replacement, section 6.5.1.)
2. Replace the laser synchronization detector [E] (1 screw).



## 6.5.4 POLYGONAL MIRROR MOTOR REPLACEMENT

**G031**



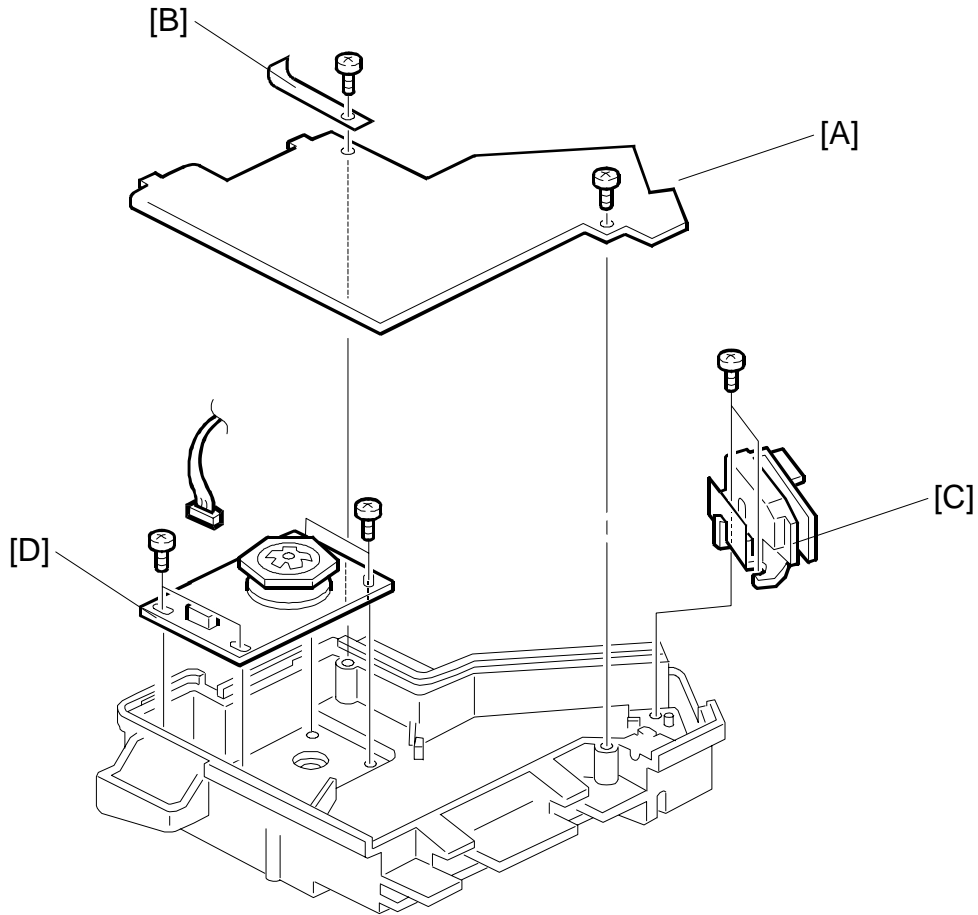
**NOTE:** When doing the following steps, take care not to damage the mirror surface with the tip of the screwdriver.

1. Remove the top cover. (Refer to Exterior Cover Removal, section 6.1.1.)
2. Remove the laser unit top cover [A] (5 screws and 1 grounding plate [B]).
3. Replace the polygonal mirror motor [C] (4 screws and 1 connector).

Replacement  
and  
Adjustment

### 6.5.5 LD UNIT/POLYGONAL MIRROR MOTOR REPLACEMENT

**G032**



#### *LD Unit*

1. Remove the top cover. (Refer to Exterior Cover Removal, section 6.1.1.)
2. Remove the laser unit top cover [A] (2 screws and 1 grounding plate [B]).
3. Replace the LD unit [C] (2 screws and 1 connector).

**NOTE:** Do not touch VR101 on the LD unit, because it is adjusted in the factory before shipment.

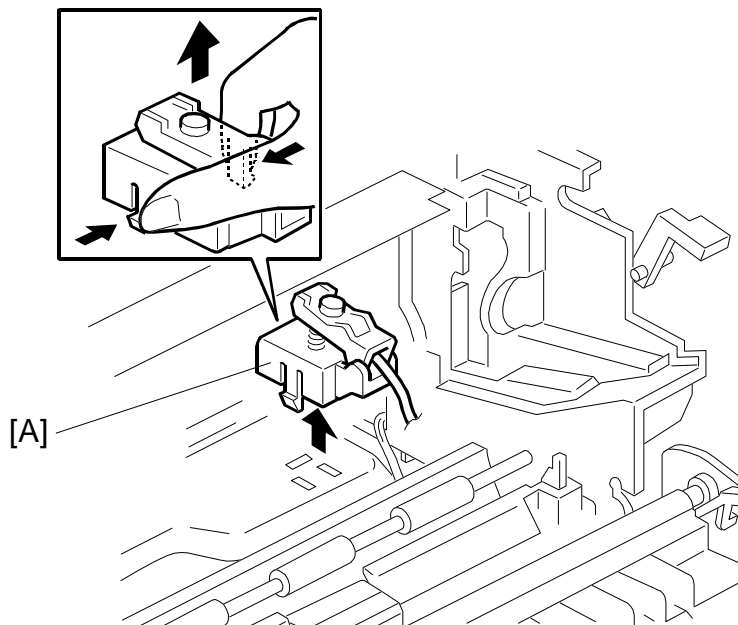
#### *Polygonal Mirror Motor*

**NOTE:** When doing the following steps, take care not to damage the mirror surface with the tip of the screwdriver.

1. Remove the top cover. (Refer to Exterior Cover Removal, section 6.1.1.)
2. Remove the laser unit top cover [A] (2 screws and 1 grounding plate [B]).
3. Replace the polygonal mirror motor [D] (4 screws and 1 connector).

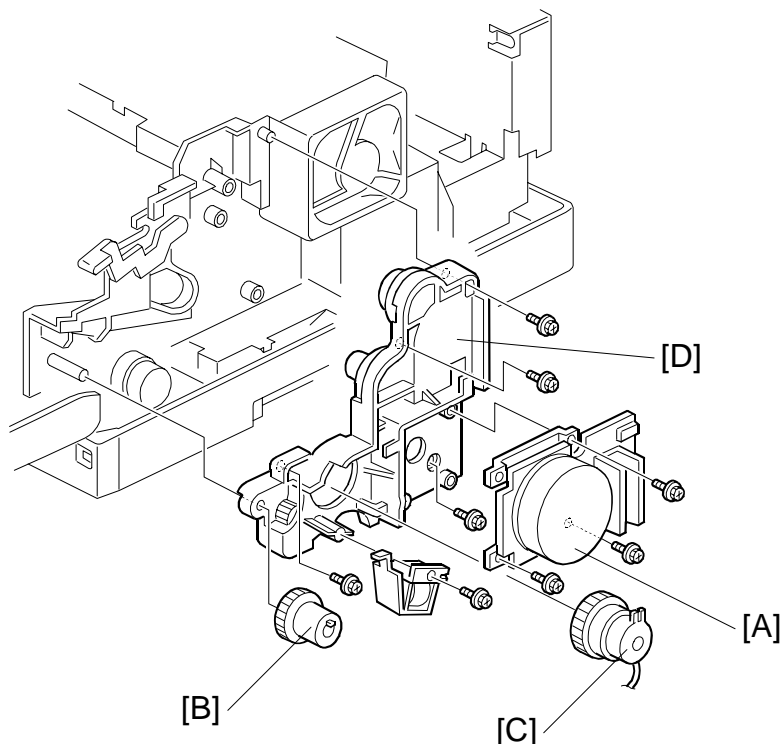
## 6.6 OTHERS

### 6.6.1 TONER NEAR-END SENSOR REPLACEMENT



1. Remove the control board cover. (Refer to Control Board Cover Removal, section 6.1.3.)
2. Remove the toner cassette.
3. Replace the toner near-end sensor [A], as shown (1 connector on the engine control board).

## 6.6.2 MAIN MOTOR/GEAR BOX REMOVAL



### **Main Motor**

1. Remove the right cover. (Refer to Exterior Cover Removal, section 6.1.1.)
2. Remove the main motor [A] (3 screws and 1 connector).

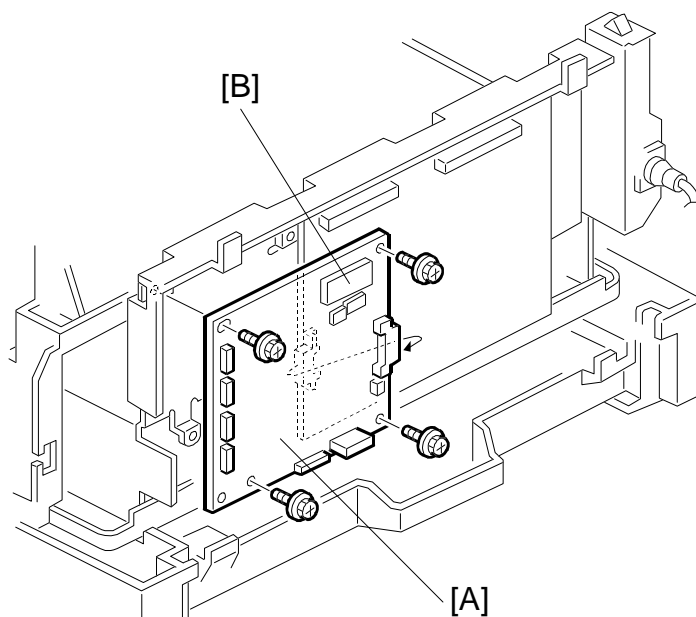
### **Gear Box**

1. Remove the control board cover. (Refer to Control Board Cover Removal, section 6.1.3.)
2. Remove the by-pass feed clutch [B]. (Refer to By-pass Feed Roller Replacement, section 6.4.2.)
3. Remove the main motor. (Refer to Main Motor Removal.)
4. Remove the registration clutch [C] (1 snap ring).
5. Remove the gear box [D] (5 screws).

### 6.6.3 ENGINE CONTROL BOARD REPLACEMENT

**⚠ CAUTION**

Before replacing the engine control board, do the following:  
Make sure that there is no print data in the printer buffer (the Data In LED must not be lit or blinking).  
If there is some data in the buffer, wait until all data has been printed.



**NOTE:** Before replacing the engine board, print out the print log (see “Service Program Mode - Print Log” in section 4).

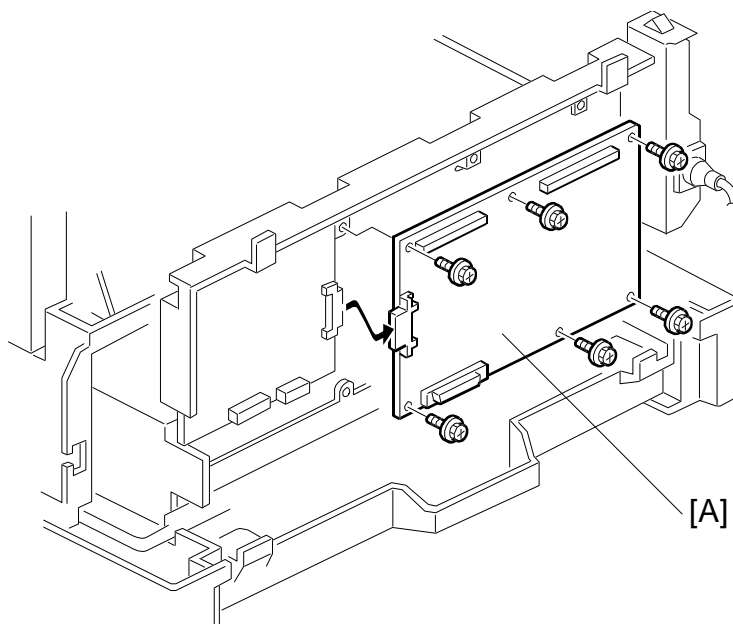
1. Remove the control board cover. (Refer to Control Board Cover Removal, section 6.1.3.)
2. Replace the engine control board [A]. (4 screws and all connectors).
3. Take the EEPROM (IC5) [B] off the old board, and put it on the new board.

Replacement  
and  
Adjustment

## 6.6.4 PRINTER CONTROL BOARD REPLACEMENT

### ⚠ CAUTION

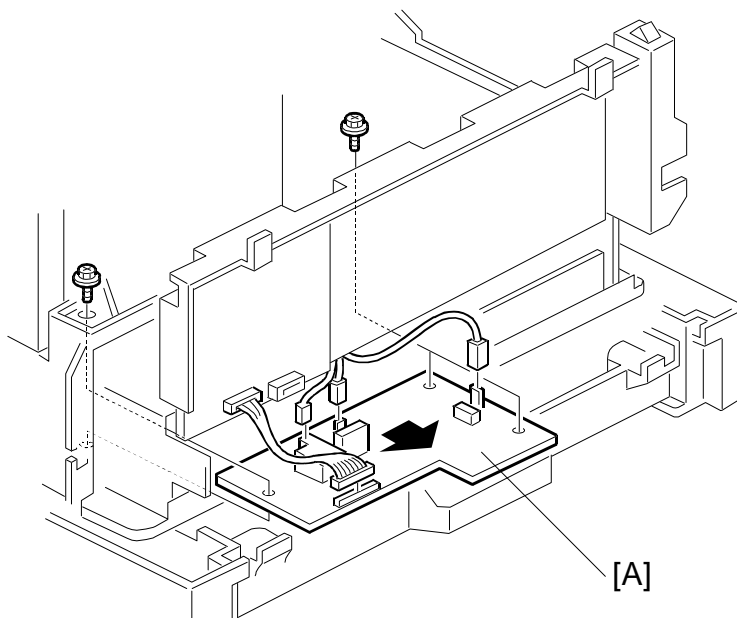
Before replacing the engine control board, do the following:  
Make sure that there is no print data in the printer buffer (the Data In LED must not be lit or blinking).  
If there is some data in the buffer, wait until all data has been printed.



**NOTE:** Before replacing the controller board, print out the configuration page (User Menu – List Print – Config Page) and the print log (see “Service Program Mode - Print Log” in section 4).

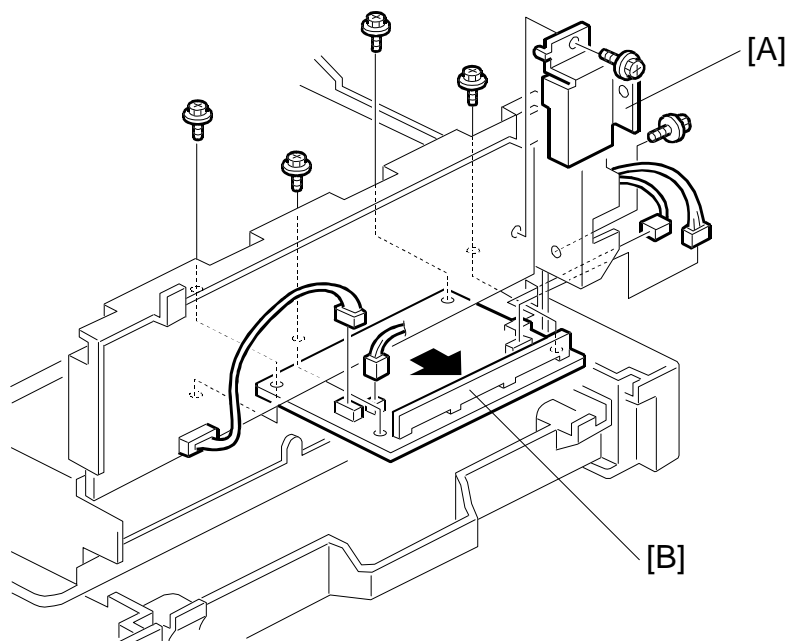
1. Remove the control board cover. (Refer to Control Board Cover Removal, section 6.1.3.)
2. Replace the printer control board [A] (6 screws and all connectors).
3. Take the NVRAM off the old board, and put it in the socket on the new board.

## 6.6.5 HIGH VOLTAGE SUPPLY BOARD



1. Remove the control board cover. (Refer to Control Board Cover Removal, section 6.1.3.)
2. Remove the LD unit. (Refer to LD Unit/Laser Synchronization Detector Replacement section 6.5.3 for G031, or LD Unit/Polygonal Mirror Motor Replacement section 6.5.5. for G032.)
3. Remove the engine control board. (Refer to Engine Control Board Replacement, section 6.6.3.)
4. Remove the high voltage supply board [A] (3 screws and 4 connectors).  
**NOTE:** Do not touch the variable resistors on the high voltage supply board, because they are adjusted in the factory before shipment.

Replacement  
and  
Adjustment

**6.6.6 POWER SUPPLY UNIT REPLACEMENT**

1. Remove the control board cover. (Refer to Control Board Cover Removal, section 6.1.3.)
2. Remove the LD unit. (Refer to LD Unit/Laser Synchronization Detector Replacement section 6.5.3 for G031, or LD Unit/Polygonal Mirror Motor Replacement section 6.5.5. for G032.)
3. Remove the printer control board. (Refer to Printer Control Board Replacement, section 6.6.4.)
4. Remove the bracket [A] (2 screws).
5. Remove the power supply unit [B] (4 screws and 4 connectors).



## 6.7 PRINT REGISTRATION ADJUSTMENT

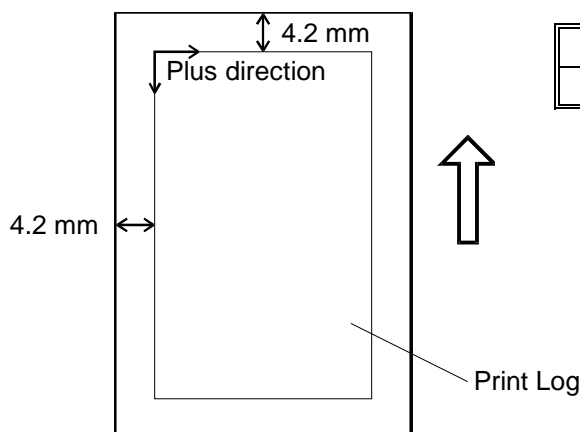
Perform the following adjustment(s) after replacing any of the following parts:

- Rollers and gears
- Polygon mirror motor
- Paper feed unit
- Paper side fence
- Memory All Clear

For more details about accessing service modes, refer to section 4.

**NOTE:** 1) Use the frame on the service mode print log for the following procedures.  
 2) Place A4 or LT paper in all paper feed trays, since the print log is available only in these sizes.  
 3) To change the paper feed tray for printing the print log, change the 'output tray' setting inside the print log mode of the service program menu to the desired paper feed tray.

1. Turn on the machine while pressing the "On line" key and "Escape" key together to enter the service mode. Use the "arrow" key until "PRINT LOG" appears.
2. Print out the print log from the desired paper feed tray and check the margin at all four sides. Adjust the registration to meet the specification given below.



### - PRINT MARGIN SPECIFICATION -

	Specification
All paper feed trays	4.2 mm

3. Check the margin at the leading and trailing edges of the frame. If out of specification, adjust with Sub Scan in the service program mode. This will adjust the paper feed timing, and will affect all paper feed trays. If the setting is moved in the **plus** direction, the top margin will be bigger.
4. Check the margin at both sides of the frame. If out of specification, adjust with Main Scan in the service program mode. This will adjust the laser start timing, and is individually adjusted for each paper feed tray. If the setting is moved in the **plus** direction, the right margin will be bigger.

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# **TROUBLESHOOTING**

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## 7. TROUBLESHOOTING

### 7.1 OPERATOR ERRORS

Function	Error Message
Front Cover Open	Close Front Cover
Paper Size Error	Check Paper Size Tray XX
Paper Misfeed	Remove Misfeed Front Cover & Tray Remove Misfeed Open Front Cover
Toner Cartridge Installation Error	Replace Toner Cartridge
Fusing Unit Installation Error	Replacing Fusing Unit
Maintenance Kit Replacement Time	Replace Maintenance Kit
Tray Installation Error	Install Tray XX
Paper End	Tray XX: Add paper
Paper Tray Error	Load Tray XX: {paper size} Load By-pass Tray XX: {paper size}
Memory Overflow	Memory Overflow
Print Overrun	Print Overrun
Hard Disk Error	Error SC 2600
Network Interface Board Error	Error SC 2700
RS232C Board Error	Error SC 2900
Memory Unit (SIMM) Error	Error SC 3100
Right Optional Board Error	Error SC 3200
Left Optional Board Error (Stinger-P3 only)	Error SC 3201

**NOTE:** XX, indicates that paper tray or paper size is variable.

#### **Front Cover Open**

Message:

Close Front Cover

Definition:

The front cover is open.

Reset Method:

Close the front cover.

#### **Paper Size Error**

Message:

Check Paper Size Tray XX

Definition:

The paper size setting of the tray differs from the actual paper size in the tray.

Reset Method:

- Pull out the paper tray and check the paper size setting then put the tray back.
- Press "Enter" and load the correct size of paper into the tray.

OPERATOR ERRORS

***Paper Misfeed***

Message:

- Remove Misfeed Front Cover & Tray
- Remove Misfeed Open Front Cover

Definition:

There is a misfeed in the printer.

Reset Method:

Remove the misfed paper.

***Toner Cartridge Installation Error***

Message:

Replace Toner Cartridge

Definition:

The toner cartridge is not installed correctly or toner has almost run out.

Reset Method:

- Set the toner cartridge correctly.
- If the image density gets too light, replace the toner cartridge.

**NOTE:** This machine only has a toner near-end sensor. There is no toner end sensor.

***Fusing Unit Installation Error***

Message:

Replacing Fusing Unit

Definition:

The fusing unit is not installed correctly.

Reset Method:

Set the fusing unit correctly.

***Maintenance Kit Replacing Time***

Message:

Replace Maintenance Kit

Definition:

It is time to replace the parts in the maintenance kit.

Reset Method:

- G031: Replace the maintenance kit.
- G032: Replace the maintenance kit, then do the User Tools – Maintenance – PM Clear procedure.

**Tray Installation Error**

Message:

Install Tray XX

Definition:

Tray XX is not installed correctly.

Reset Method:

Set the tray correctly.

**Paper End**

Message:

Tray XX: Add Paper

Definition:

Paper has run out in tray XX.

Reset Method:

Load paper.

**Paper Tray Error**

Message:

- Load Tray XX: {paper size}
- Load Bypass Tray: {paper size}

Definition:

- Tray XX (or the by-pass tray) is empty.
- The actual size of paper loaded in tray XX (or the by-pass tray) does not match the size for which the page was created.

Reset Method:

Load paper of the correct size in the specified feed direction into tray XX (or the by-pass tray), and print automatically. If not, check that the paper size setting in the tray is correct.

- NOTE:** 1) When “Auto Select” is specified for the paper source using the printer driver, this message might appear when there is paper of the correct size but in the different feed direction in any of the trays.
- 2) The page is printed on the incorrect paper size in tray XX (or the by-pass tray) in the following cases.
- a) If you press “Enter” without loading the correct paper.
  - b) If a specified period of time has passed with the Auto Continue feature on. (Auto Continue does not work if this error exists.) If that happens, you cannot continue printing if there is a paper size error. You should take one of the following actions to clear this error.
    - Press “Enter”.
    - Open and close any of the trays.

OPERATOR ERRORS

***Memory Overflow***

Message:

Memory Overflow

Definition:

There is not enough memory to print the data.

Reset Method:

If the "Auto Continue" feature is on or when the "Enter" key is pressed, the data in the memory is printed out. To clear this message, change the print resolution from 1,200 dpi to 600 dpi or 300 dpi, and try printing again. If the job cannot be printed completely, you should increase the memory capacity.

***Print Overrun***

Message:

Print Overrun

Definition:

The data sent to the printer was too complex.

Reset Method:

Press "Enter" to print out the data sent to the printer. If you do not want to lose any of the transferred data, set the "Page Protect" feature to "On" before printing the job. If you cannot clear this message, simplify the print job.

**NOTE:** Make sure to return the "Page Protect" feature to "Off" after the print job. With the "Page Protect" feature "On", printer performance might be reduced.

***Hard Disk Error***

Message:

Error SC\_2600

Definition:

Error in the optional HDD.

Reset Method:

Remove the HDD from the printer and turn the printer's main switch off and on. Then try to do the print job again.

***Network Interface Board Error***

Message:

Error SC\_2700

Definition:

Error in the optional network interface board.

Reset Method:

Remove the network interface board from the printer and turn the printer's main switch off and on. Then try to do the print job again.



***RS232C Board Error***

Message:

Error SC\_2900

Definition:

Error in the optional RS232C board.

Reset Method:

Remove the RS232C board from the printer and turn the printer's main switch off and on. Then try to do the print job again.

***Memory Unit (SIMM) Error***

Message:

Error SC\_3100

Definition:

Error in the optional memory unit (SIMM).

Reset Method:

Remove the memory unit from the printer and turn the printer's main switch off and on. Then try to do the print job again.

**NOTE:** If you remove the memory unit, you might not be able to print a job that contains large or complex data.

***Right Optional Board Error***

Message:

Error SC\_3200

Definition:

Error in the right optional board.

Reset Method:

Remove the right optional board from the printer and turn the printer's main switch off and on. Then try to do the print job again.

***Left Optional Board Error***

Message:

Error SC\_3201

Definition:

Error in the left optional board.

Reset Method:

Remove the left optional board from the printer and turn the printer's main switch off and on. Then try to do the print job again.

## 7.2 PRINTER ENGINE SC CODES

SC No.	Function
302	High Voltage Power Supply Error
320	Polygon Mirror Motor Error
322	Laser Synchronization Error
500	Main Motor Error
542	Fusing Temperature Warm-up Error
543	Fusing High Temperature Error
544	Fusing Low Temperature Error
998	Fusing Unit Mismatch
999	Communication Error

**NOTE:** To clear SC codes from SC542 to SC544, repair the machine then use Fuser Error Clear in service mode (turn on the machine while pressing 'On Line' and 'Escape' to access this). Other SC codes are automatically cleared after the machine is repaired.

### ***SC302: High Voltage Power Supply Error***

Definition:

- A charge roller current leak signal is detected.
- A transfer roller current leak signal is detected.
- A development bias leak signal is detected.

Possible Causes:

- Charge roller damaged.
- Transfer roller damaged.
- Discharge brush grounding problem
- High voltage supply board defective
- Poor PSU connection

### ***SC320: Polygon Mirror Motor Error***

Definition:

The polygon mirror motor does not reach its operating speed within 10 seconds after the polygon mirror motor on signal, or the lock signal is not detected for more than 10 seconds continuously during operation.

Possible Causes:

- Polygon mirror motor defective
- Poor connection between the polygon mirror motor driver and the engine control board
- Engine control board defective

**SC322: Laser Synchronization Error****Definition:**

The laser synchronization signal cannot be detected by the main scan synchronization detector board for more than 4 consecutive 100 ms intervals.

**Possible Causes:**

- Laser synchronization detector out of position
- Laser synchronization detector defective
- Engine control board defective

**SC500: Main Motor Error****Definition:**

A main motor lock signal is detected for more than 1 second or the lock signal is not detected for more than 500 ms during rotation.

**Possible Causes:**

- Too much load on the drive mechanism
- Main motor defective

**SC542: Fusing Temperature Warm-up Error****Definition:**

The fusing temperature does not reach 80°C within 60 seconds after the main switch is turned on or after the covers have been closed. Or, during warming-up, the fusing temperature does not change by at least 3°C within 5 seconds.

**Possible Causes:**

- Fusing thermistor defective or out of position
- Fusing lamp open
- Fusing thermofuse open
- Power supply unit defective
- Poor fusing unit connection
- Engine control board defective

**SC543: Fusing High Temperature Error****Definition:**

A fusing temperature of over 230°C is detected for 1 second by the fusing thermistor.

**Possible Causes**

- Fusing thermistor defective
- Power supply unit defective

***SC544: Fusing Low Temperature Error***

Definition:

A fusing temperature of lower than 100°C is detected for 1 second by the fusing thermistor (this error does not apply when the machine is in energy saver mode).

Possible causes

- Fusing thermistor defective
- Power supply unit defective

***SC998: Fusing Unit Mismatch***

Definition:

The fusing unit for a different area is installed in the machine.

Possible causes

- Wrong fusing unit

***SC999: Communication Error***

Definition:

Communication error between engine and control board.

Possible causes

- Command error or parity error between engine and control board.

## 7.3 DIAGNOSTIC ERROR CODES

### 7.3.1 DIAGNOSTIC ERROR CODE TABLE

The diagnostic error codes are shown in the following table.

#### *Power-up Diagnostic Mode*

Device Name	Device Code	Error Code	Description	Possible Cause
VR4300 (CPU) Timer	01	SC2102	CPU (VR4300) timer error	• Printer Control Board defective
Code ROM	02	SC2100	Flash ROM check sum error	• Printer Control Board defective
Resident DRAM	03	SC2101	Resident DRAM check error	• Printer Control Board defective
VR4300 Exception	04	SC2102	Exception interrupt check error	• Printer Control Board defective
VR4300 Cache	05	SC2102	Data cache or instruction cache check error	• Printer Control Board defective
VR4300 FPU	06	SC2102	Floating point operation error	• Printer Control Board defective
ASIC Timer	07	SC2104	ASIC timer error	• Printer Control Board defective
NVRAM	08	SC2105	NVRAM check error	• Printer Control Board defective
ASIC P1284 (parallel port)	09	--	Not tested during power-up diagnostics	
ASIC Engine I/F	0A	SC2500	Engine interface check error	• Printer Control Board defective
Font ROM	0B	SC2103	Font ROM CRC check error	• Printer Control Board defective
ASIC PVDMA	0D	SC2104	PVDMA operation error in the ASIC	• Printer Control Board defective
Optional DIMM	10	SC2800	DIMM check error	• Remove the DIMM
Optional SIMM	11	SC3100	SIMM check error	• Optional SIMM defective
HDD	12	SC2600	HDD check error	• Optional HDD defective
NIB	13	SC2700	NIB check error	• Optional NIB defective
RS232C Test	14	SC2900	RS232C test error	• Optional RS232C defective
Option0	15	SC3200	Unidentified or unsupported device in the right option slot	• Optional device in the right option slot defective
Option1 (Only G031)	15	SC3201	Unidentified or unsupported device in the left option slot	• Optional device in the left option slot defective

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DIAGNOSTIC ERROR CODES

***Power-up and Detailed Diagnostic Modes – Program Execution Errors***

Error Code	Description	Possible Cause
**A1	Accessing error for prohibited address	• Printer Control Board defective
**A2	Unmatched load or fetch address for TLB	
**A3	Unmatched store address for TLB	
**A4	Load or fetch address error	
**A5	Store address error	
**A6	Bus error for fetch	
**A7	Bus error for load or store	
**A8	System call exception	
**A9	Break point exception	
**AA	Fetch unsupported command	
**AB	Co-processor exception	
**AC	Overflow exception	
**AD	Trap command exception	
**AF	Floating point operation exception	
**B7	Watch exception	
**B8	Data access or fetch with vertical address	
**E0	Interrupt 0 exception	
**E1	Interrupt 1 exception	
**E2	Interrupt 2 exception	
**E3	Interrupt 3 exception	
**E4	Interrupt 4 exception	
**E5	Interrupt 5 exception	

The above “\*\*” means the device code for which the diagnostic program error occurred during its device test. For details of the device codes, refer to the ‘Device Code’ column of the “Power-up Diagnostic Mode” table.

**Detailed Diagnostic Mode – Other Errors**

Device.	Code	Description	Possible Cause
VR4300 Timer	0101	Clock frequency error	• Printer Control Board defective
	0102	Interrupt error	
	0103	Exception interrupt error	
	0104	Interrupt masking error	

Device.	Code	Description	Possible Cause
Code ROM	0201	Sum check error	• Printer Control Board defective

Device.	Code	Description	Possible Cause
Resident DRAM	0301	Write and read check error	• Printer Control Board defective

Device.	Code	Description	Possible Cause
VR4300 Exception	0401	Error during the address error check with load or fetch instructions	• Printer Control Board defective
	0402	Error during the address error check with storing instructions	
	0403	Error during the bus error check with jump instructions	
	0404	Error during the bus error check with load or storing instructions	
	0405	Error during the system call check with SYSCALL instructions	
	0406	Error during the break point check with BREAK instructions	
	0407	Error during the unsupported instructions check of the VR4300	
	0408	Coprocessor check error	
	0409	Overflow check error	
	040A	Error during the trap check with the TRAP instructions	
	040B	Floating point calculation check error	
	040C	Error during the watch-LO register check	
	040D	VR4300 TLB register check error	

Device.	Code	Description	Possible Cause
VR4300 Cache	0501	Instruction cache size error	• Printer Control Board defective
	0502	Instruction cache hit error	
	0503	Instruction cache write back error	
	0504	Instruction cache clear error	
	0511	Data cache size error	
	0512	Data cache hit error	
	0513	Data cache write back error	
	0514	Data cache write back clear error	
	0515	Data cache clear error	

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DIAGNOSTIC ERROR CODES

Device.	Code	Description	Possible Cause
VR4300 FPU	0601	Addition error during floating point operations with low accuracy mode	<ul style="list-style-type: none"> <li>Printer Control Board defective</li> </ul>
	0602	Subtraction error during floating point operations with low accuracy mode	
	0603	Division error during floating point operations with low accuracy mode	
	0604	Multiplication error during floating point operations with low accuracy mode	
	0605	Addition error during floating point operations with high accuracy mode	
	0606	Subtraction error during floating point operations with high accuracy mode	
	0607	Division error during floating point operations with high accuracy mode	
	0608	Multiplication error during floating point operations with high accuracy mode	

Device.	Code	Description	Possible Cause
ASIC Timer	0701	ASIC interrupt request error	<ul style="list-style-type: none"> <li>Printer Control Board defective</li> </ul>
	0702	VR4300 interrupt request error	
	0703	Interrupt check error	
	0704	Interrupt mask error	
	0705	Timer frequency error	

Device.	Code	Description	Possible Cause
NVRAM	0802	NVRAM verification check error	<ul style="list-style-type: none"> <li>Printer Control Board defective</li> </ul>
	0804	Write error	

Device.	Code	Description	Possible Cause
ASIC P1284	0901	Timeout error	<ul style="list-style-type: none"> <li>Printer Control Board defective</li> </ul>
	0902	Interrupt request error of the ASIC when the STROBE signal goes low	
	0903	Interrupt request error of the VR4300 when the STROBE signal goes low	
	0904	Interrupt start error of the VR4300 when the STROBE signal goes low	
	0905	Interrupt masking error when the STROBE signal goes low	
	0906	Interrupt request error of the ASIC when the STROBE signal goes high	
	0907	Interrupt request error of the VR4300 when the STROBE signal goes high	
	0908	Interrupt start error of the VR4300 when the STROBE signal goes high	
	0909	Interrupt masking error when the STROBE signal goes high	
	090A	Interrupt request error of the ASIC when the INIT signal goes low	



Device.	Code	Description	Possible Cause
ASIC P1284	090B	Interrupt request error of the VR4300 when the INIT signal goes low	• Printer Control Board defective
	090C	Interrupt start error of the VR4300 when the INIT signal goes low	
	090D	Interrupt masking error when the INIT signal goes low	
	090E	Interrupt request error of the ASIC when the INIT signal goes high	
	090F	Interrupt request error of the VR4300 when the INIT signal goes high	
	0910	Interrupt start error of the VR4300 when the INIT signal goes high	
	0911	Interrupt masking error when the INIT signal goes high	
	0912	Interrupt request error of the ASIC when the SELECT signal goes low	
	0913	Interrupt request error of the VR4300 when the SELECT signal goes low	
	0914	Interrupt start error of the VR4300 when the SELECT signal goes low	
	0915	Interrupt masking error when the SELECT signal goes low	
	0916	Interrupt request error of the ASIC when the SELECT signal goes high	
	0917	Interrupt request error of the VR4300 when the SELECT signal goes high	
	0918	Interrupt start error of the VR4300 when the SELECT signal goes high	
	0919	Interrupt masking error when the SELECT signal goes high	
	091A	Interrupt request error of the ASIC when the FEED signal goes low	
	091B	Interrupt request error of the VR4300 when the FEED signal goes low	
	091C	Interrupt start error of the VR4300 when the FEED signal goes low	
	091D	Interrupt masking error when the FEED signal goes low	
	091E	Interrupt request error of the ASIC when the FEED signal goes high	
	091F	Interrupt request error of the VR4300 when the FEED signal goes high	
	0920	Interrupt start error of the VR4300 when the FEED signal goes high	
	0921	Interrupt masking error when the FEED signal goes high	
	0922	Loopback data error	
	0923	Interrupt request error of the ASIC in DMA mode	
	0924	Interrupt request error of the VR4300 in DMA mode	
	0925	Interrupt start error of the VR4300 in DMA mode	

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## DIAGNOSTIC ERROR CODES

Device.	Code	Description	Possible Cause
ASIC P1284	0926	Interrupt masking error in DMA mode	• Printer Control Board defective
	0927	Loopback data error in DMA mode	
	0928	Interrupt request error of the ASIC in ECP DMA mode	
	0929	Interrupt request error of the VR4300 in ECP DMA mode	
	092A	Interrupt start error of the VR4300 in ECP DMA mode	
	092B	Interrupt masking error in ECP DMA mode	
	092C	Loopback data error in ECP DMA mode	

Device.	Code	Description	Possible Cause
Engine I/F	0A01	Transmission timeout	• Printer Control Board defective
	0A02	Reception timeout	
	0A03	Reception parity error	
	0A04	Data error	
	0A05	Interrupt request error of the ASIC during command reception	
	0A06	Interrupt request error of the VR4300 during command reception	
	0A07	Interrupt start error of the VR4300 during command reception	
	0A08	Interrupt masking error during command reception	

Device.	Code	Description	Possible Cause
Font ROM	0B01	Font ROM CRC check error	• Printer Control Board defective

Device.	Code	Description	Possible Cause
ASIC PVDMA	0D01	Interrupt request error of the ASIC in PVDMA mode	• Printer Control Board defective
	0D02	Interrupt request error of the VR4300 in PVDMA mode	
	0D03	Interrupt start error of the VR4300 in PVDMA mode	
	0D04	Interrupt masking error in PVDMA mode	
	0D05	PVDMA mode timeout	
	0D06	PVDMA read bus error	
	0D07	PVDMA write bus error	
	0D08	FILL operation error	
	0D09	MOVE operation error	
	0D0A	HALF operation error	
	0D0B	QUART operation error	
	0D0C	K3 operation error	
	0D0D	K3 double operation error	

Device.	Code	Description	Possible Cause
Optional DIMM	1010	Formatting error	<ul style="list-style-type: none"> <li>Optional DIMM defective</li> <li>Printer Control Board defective</li> </ul>
	1011	Version error	
	1012	NVRAM version error	

Device.	Code	Description	Possible Cause
Optional SIMM	1102	SIMM size error: Unsupported SIMM size	<ul style="list-style-type: none"> <li>Optional SIMM defective</li> <li>Printer Control Board defective</li> </ul>
	1103	8MB SIMM check error	
	1104	16MB SIMM check error	
	1105	32MB SIMM check error	

Device.	Code	Description	Possible Cause
HDD	1201	The CPU did not receive the device ready signal after the specified time.	<ul style="list-style-type: none"> <li>Optional HDD defective</li> <li>Printer Control Board defective</li> </ul>
	1202	Interrupt request error of the ASIC in HDD mode	
	1203	Interrupt request error of the VR4300 in HDD mode	
	1204	Interrupt start error of the VR4300 in HDD mode	
	1205	HDD interrupt masking error	
	1206	HDD register error	
	1207	HDD buffer RAM error	
	1208	HDD ECC error	
	1209	HDD ROM/RAM error	
	120A	HDD diagnostic command error	
	120B	HDD data transmission error	
	120C	HDD read verification error	

Device.	Code	Description	Possible Cause
NIB	1301	Initialization error	<ul style="list-style-type: none"> <li>Optional NIB defective</li> <li>Printer Control Board defective</li> </ul>
	1302	Command timeout error	
	1303	Command reception interrupt request error of the ASIC in NIB mode	
	1304	Command reception interrupt request error of the VR4300 in NIB mode	
	1305	Command reception interrupt start error in NIB mode	
	1306	Command reception interrupt masking error in NIB mode	
	1307	NIB command error	
	1308	NIB buffer full error	

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DIAGNOSTIC ERROR CODES

Device.	Code	Description	Possible Cause
RS232C	1401	Initialization error	Optional RS232C defective Printer Control Board defective
	1402	Empty interrupt request error of the ASIC in RS232C mode	
	1403	Empty interrupt request error of the VR4300 in RS232C mode	
	1404	Empty interrupt start error of the VR4300 in RS232C mode	
	1405	Empty interrupt masking error of the in RS232C mode	
	1406	DSR error	
	1407	Command timeout error	
	1408	Loopback error	

Device.	Code	Description	Possible Cause
Option Error	1501	Unidentified or unsupported device in the right option slot	Optional device in the right option slot defective
	1502	Unidentified or unsupported device in the left option slot (only G031)	Optional device in the left option slot defective

## 7.4 ELECTRICAL COMPONENT DEFECTS

### 7.4.1 SENSORS

Component (Symbol)	CN	Condition	Symptom
Fusing Exit (S1)	6-8 (ECB)	Open	A paper jam at the fusing unit whenever a print is made.
		Shorted	The Paper Jam message appears even if there is no paper.
Tray Paper End (S2)	4-1 (ECB)	Open	The Paper End message appears even if paper is placed in the paper tray.
		Shorted	The Paper End message does not appear even if there is no paper in the paper tray.
Tray Paper Near-end (S3)	4-4 (ECB)	Open	The Paper Near End message does not appear on the PC even if the paper tray is almost empty.
		Shorted	The Paper Near End message appears on the PC even if enough paper is placed in the paper tray.
By-pass Tray Paper Set (S4)	3-5 (ECB)	Open	When selecting the by-pass tray, the Paper End message does not appear even if there is no paper in the by-pass tray.
		Shorted	When selecting the by-pass tray, the Paper End message appears even if there is paper in the by-pass tray.
Registration (S5)	3-2 (ECB)	Open	A paper jam at the registration roller when a print is made.
		Shorted	The Paper Jam message appears even if there is no jam.
Toner Near-end (S6)	5-2 (ECB)	Open	Toner is not added, even if there is not enough toner in the toner supply unit.
		Shorted	Toner is added, even if there is enough toner in the toner supply unit.

### 7.4.2 SWITCHES

Component (Symbol)	CN	Condition	Symptom
Main (SW1)	101-1,2 (PSU)	Open	The machine does not turn on.
		Shorted	The machine does not turn off.
Front Cover Safety (SW2)	103-1,2 (PSU)	Open	The Cover Open message is displayed even if the front cover is closed.
		Shorted	The Cover Open message is not displayed even if the front cover is open.
Tray Paper Size (SW3)	4-5,6,8 (ECB)	Open	The CPU cannot detect the proper paper size, and misfeeds may occur when a print is made.
		Shorted	

### 7.4.3 FUSES

Fuse	Rating		Symptom when turning on the main switch
	115 V	220 ~ 240 V	
Power Supply Board			
FU1	5 A/125 V	3.15 A/250 V	No response.
FU2	15 A/250 V	6.3 A/250 V	After turning on the main switch, SC542 is displayed.
FU3	5 A/125 V	5 A/250 V	No response.

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

# **ENVELOPE FEEDER G913**

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA



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## 1. OVERALL INFORMATION

### 1.1 SPECIFICATIONS

Envelope Size:	Com#10 (4.125" x 9.5") C6 (114 x 162 mm, 4.49" x 6.38") DL (4.33" x 8.66") Monarch (3.875" x 7.5")
Paper Weight:	72 g/m <sup>2</sup> ~ 90 g/m <sup>2</sup> , 19 ~ 24 lb
Capacity:	60 envelopes (72 ~ 90 g/m <sup>2</sup> , 19 ~ 24 lb)
Size (W x D x H):	G031: 450 mm x 552 mm x 91 mm (17.7" x 21.7" x 3.6") G032: 360 mm x 421 mm x 119 mm (14.2" x 16.6" x 4.7")
Weight:	G031: 2.5 kg G032: 1.6 kg

### 1.2 MECHANICAL COMPONENT LAYOUT

This optional unit is a tray that slides into the optional paper feed unit, replacing the paper tray. This unit includes a friction pad. The layout is same as the paper tray. Refer to the paper feed unit manual (section 1.2) for the friction pad layout.

---

## **2. DETAILED SECTION DESCRIPTIONS**

### **2.1 PAPER LIFT**

Refer to the paper feed section in the service manual for the main body.

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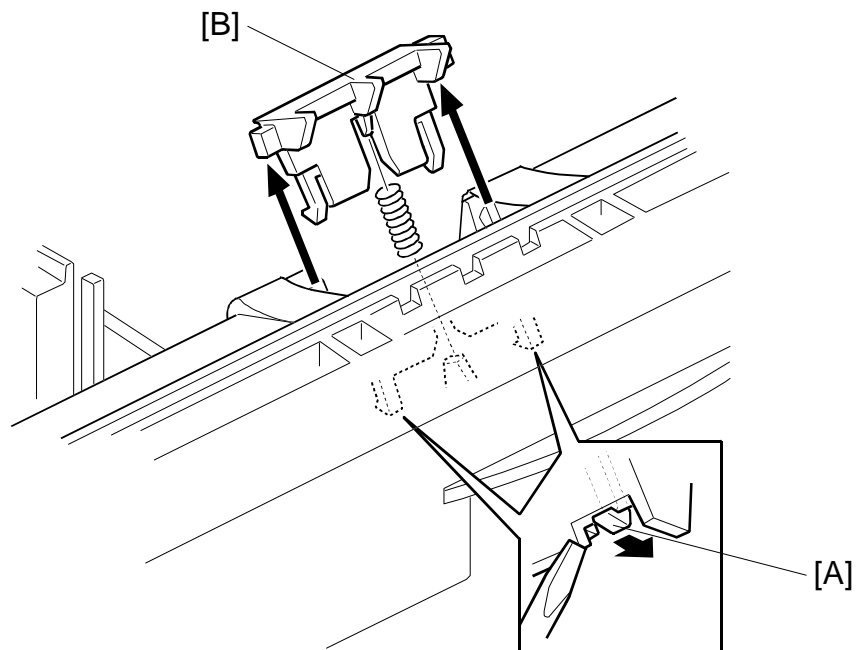
### 3. INSTALLATION

See the “Installing the Envelope Feeder” in section 2 (Installing Options) of the operating instructions.

---

## 4. REPLACEMENT AND ADJUSTMENT

### 4.1 FRICTION PAD REPLACEMENT



1. Draw out the envelope feeder.
2. While unhooking hooks [A], replace the friction pad [B], as shown.

**NOTE:** Make sure to unhook the hooks, or the hooks may be damaged.

# **PAPER FEED UNIT G914/G915**

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

# 1. OVERALL MACHINE INFORMATION

## 1.1 SPECIFICATIONS

### 1.1.1 G031 (PAPER FEED UNIT G915-17, G914-17)

Copy Paper Size:	Maximum A3/11" x 17" Minimum A5 (lengthwise)
Copy Paper Weight:	60 ~ 90 g/m <sup>2</sup> , 16 ~ 24 lb
Dimensions (W x D x H):	450 mm x 528.8 mm x 125 mm
Tray Capacity:	500 sheets
Weight:	Less than 5.7 kg (13 lb)

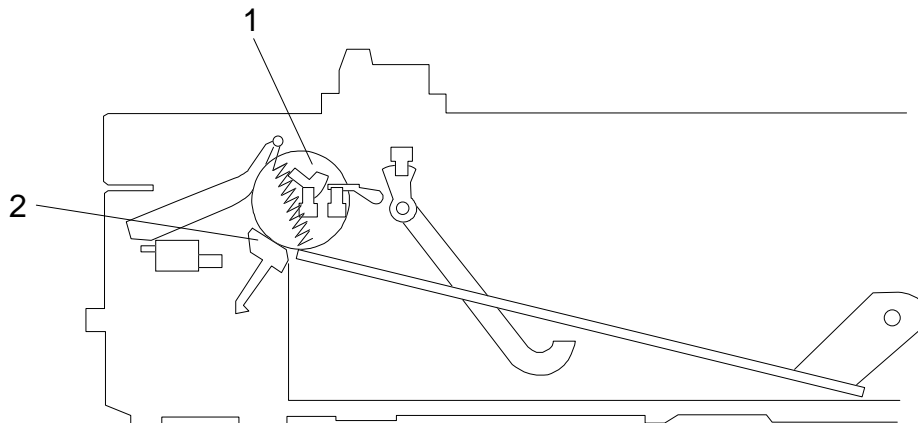
### 1.1.2 G032 (PAPER FEED UNIT G914-57)

Copy Paper Size:	Maximum A4/8.5" x 11" (sideways) Minimum A5 (lengthwise)
Copy Paper Weight:	60 ~ 90 g/m <sup>2</sup> , 16 ~ 24 lb
Dimensions (W x D x H):	360 mm x 385 mm x 123 mm
Tray Capacity:	500 sheets
Weight:	Less than 4.0 kg (9 lb)

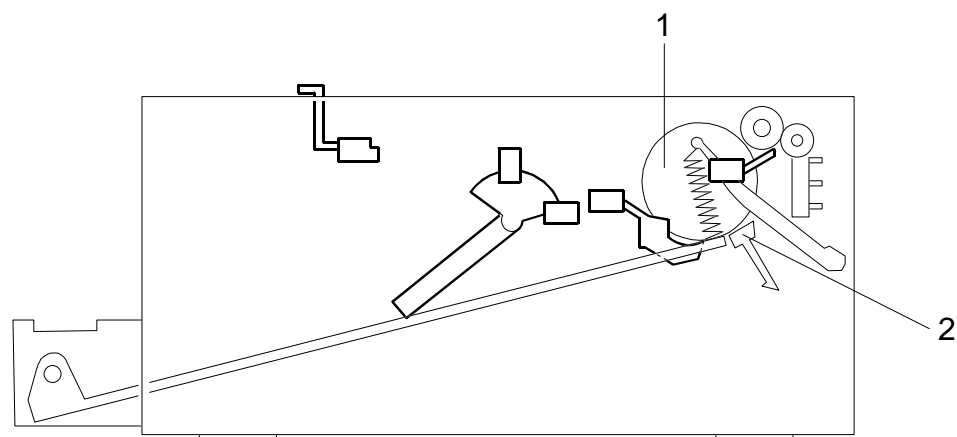
**NOTE:** See page 1-5 for Machine Configuration Table

## 1.2 MECHANICAL COMPONENT LAYOUT

### **G031**



### **G032**



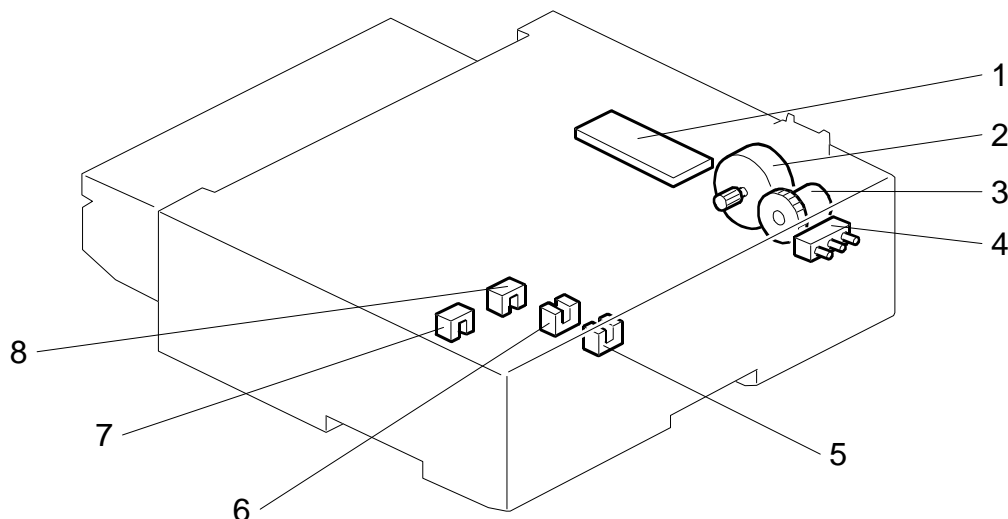
1. Paper Feed Roller

2. Friction Pad

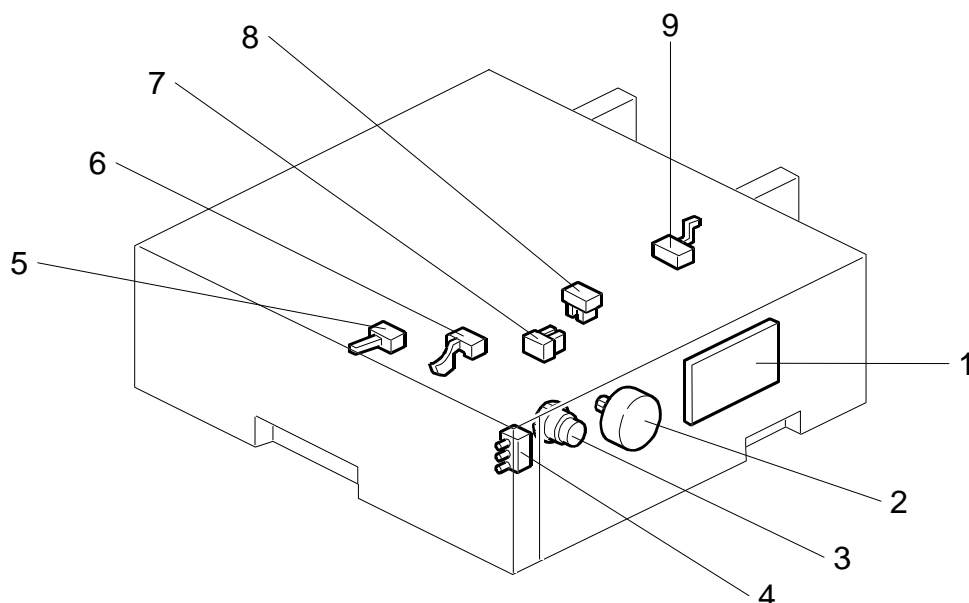


## 1.3 ELECTRICAL COMPONENT LAYOUT

### G031



### G032



1. Paper Feed Unit Board
2. Paper Feed Motor
3. PFU Paper Feed Clutch
4. PFU Paper Size Switch
5. PFU Paper Feed Sensor

6. PFU Paper End Sensor
7. PFU Paper Near-end Sensor
8. PFU Paper Near-end Sensor
9. PFU Cassette Sensor  
(G032 only)

## 1.4 ELECTRICAL COMPONENT DESCRIPTION

Symbol	Name	Function	Index No.
<b>Motor</b>			
M1	Paper Feed Motor	Drives all the rollers	2
<b>Sensors</b>			
S1	PFU Paper Feed Sensor	Detects the paper from the paper tray and also detects misfeeds.	5
S2	PFU Paper End Sensor	Informs the CPU when there is no paper in the tray	6
S3, S4	PFU Paper Near-end Sensor	Informs the CPU of the estimated remaining paper amount (there are 4 signal patterns)	7, 8
S5	PFU Cassette Sensor (G032 only)	Detects whether the main cassette is installed	9
<b>Switch</b>			
SW1	PFU Paper Size Switch	Detects the paper size selected by the dial	4
<b>Clutch</b>			
MC1	PFU Paper Feed Clutch	Starts paper feed	3
<b>PCB</b>			
PCB1	PFU Paper Feed Unit Board	Interfaces the sensor signals with the printer	1

## 2. DETAILED SECTION DESCRIPTIONS

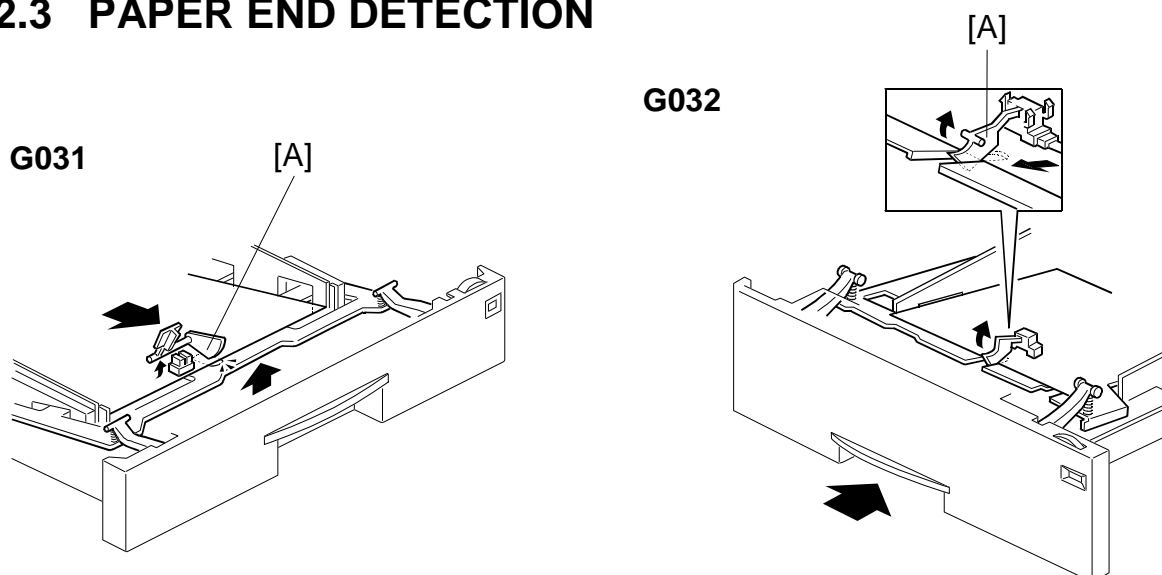
### 2.1 PAPER SIZE DETECTION

Refer to Paper Size Detection for G031 (section 2 of the manual for the main body).

### 2.2 PAPER LIFT

Refer to Paper Lift, (section 2 of the manual for the main body).

### 2.3 PAPER END DETECTION

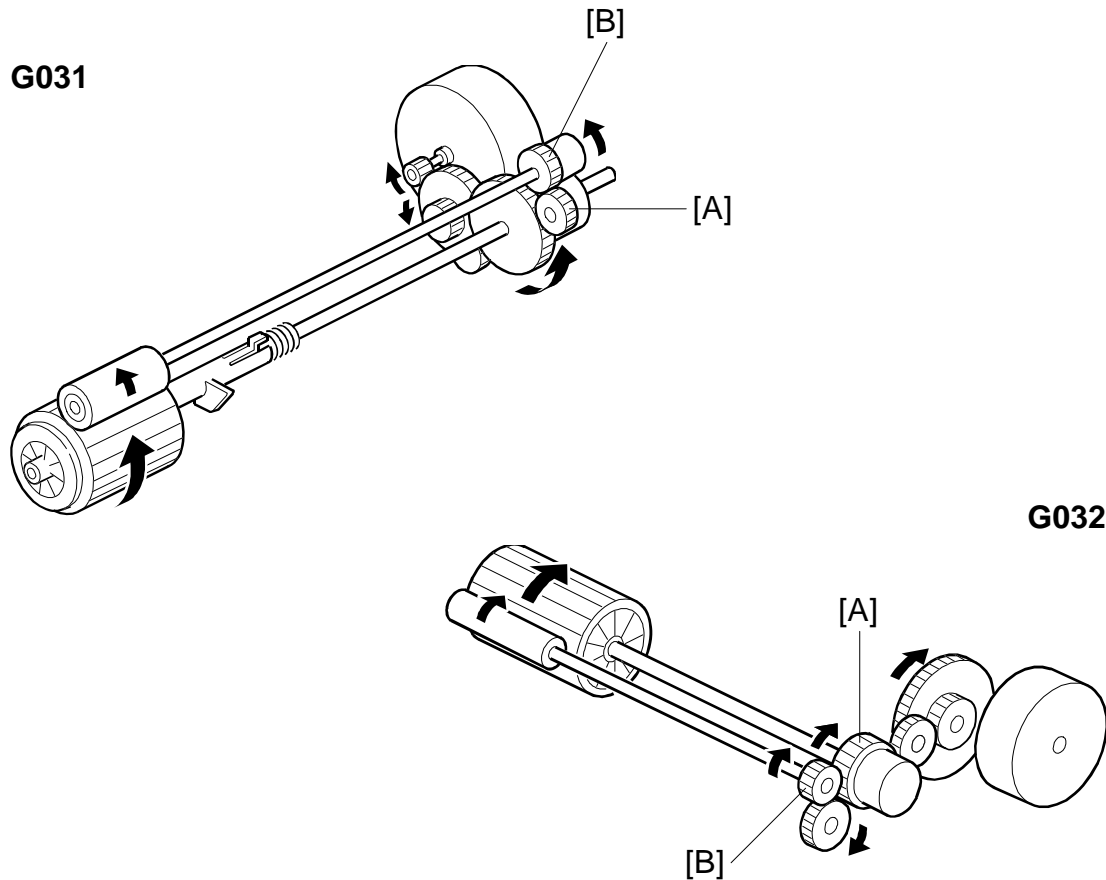


When the paper tray runs out of paper, the actuator [A] of the paper end sensor drops into the cutout in the tray bottom plate and this activates the paper end sensor.

### 2.4 PAPER NEAR END DETECTION

When the paper in the paper tray is running out, the actuator of the tray paper near end sensor activates the paper near end sensors. The signals from the sensors indicate whether there are 450, 250, or 50 sheets remaining. There is no indicator on the machine's operation panel; it is only possible to check from a PC.

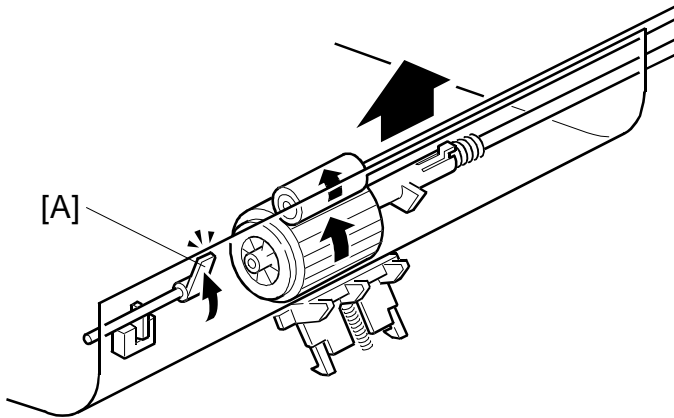
## PAPER FEED

**2.5 PAPER FEED**

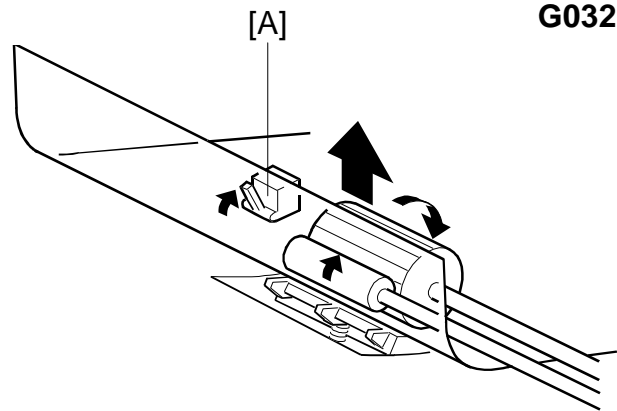
The paper feed motor drives the PFU paper feed clutch gear [A] and the drive roller gear [B] through several gears.

The paper feed unit uses a feed roller and friction pad mechanism. The friction pad only allows the top sheet to be fed.

G031



G032



The PFU paper feed clutch turns on at the same time as the paper feed motor starts. The paper actuates the PFU paper feed sensor [A], and the drive roller feeds the paper to the registration rollers.

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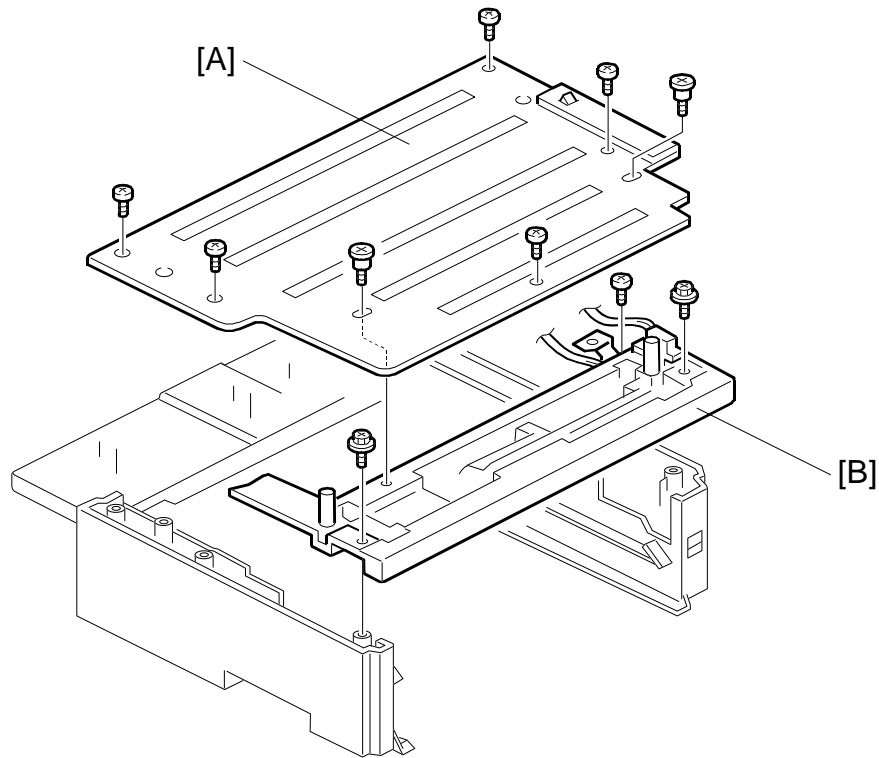
### **3. INSTALLATION**

See the “Paper Feed Unit Installation” sheet that comes with the Operating Instructions.

## 4. REPLACEMENT AND ADJUSTMENT

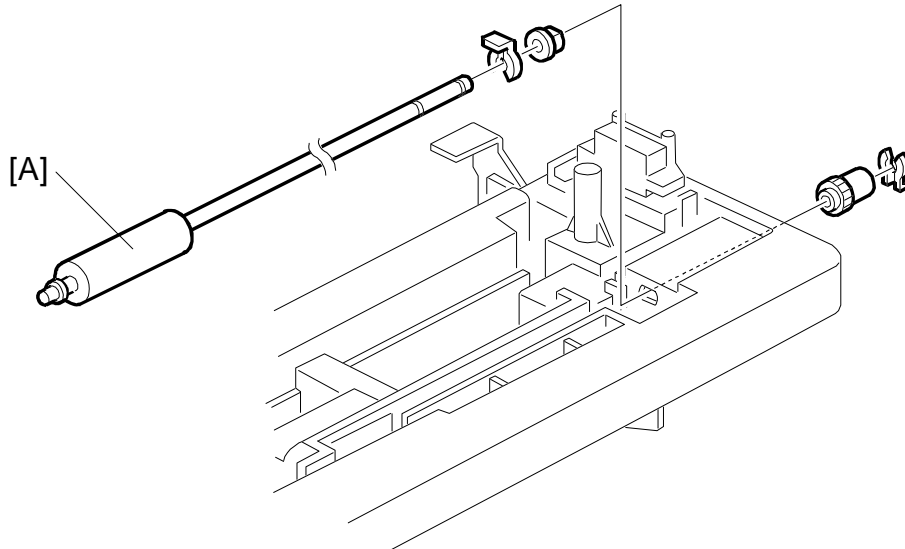
### 4.1 PAPER FEED UNIT (OPTION FOR G031)

#### 4.1.1 PAPER FEED ASSEMBLY REMOVAL



1. Remove the top cover [A] (7 screws).
2. Remove the paper feed assembly [B] (3 screws and 5 connectors).

#### 4.1.2 DRIVE ROLLER REPLACEMENT

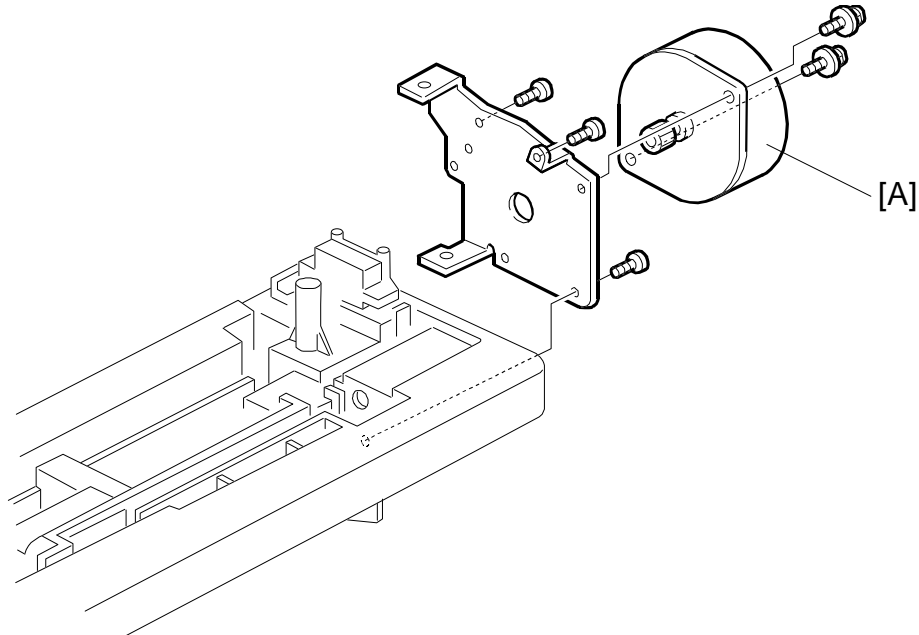


1. Remove the paper feed assembly. (Refer to Paper Feed Assembly Removal.)
2. Replace the drive roller [A] (2 snap rings).  
Do not touch the drive roller with your bare hands.



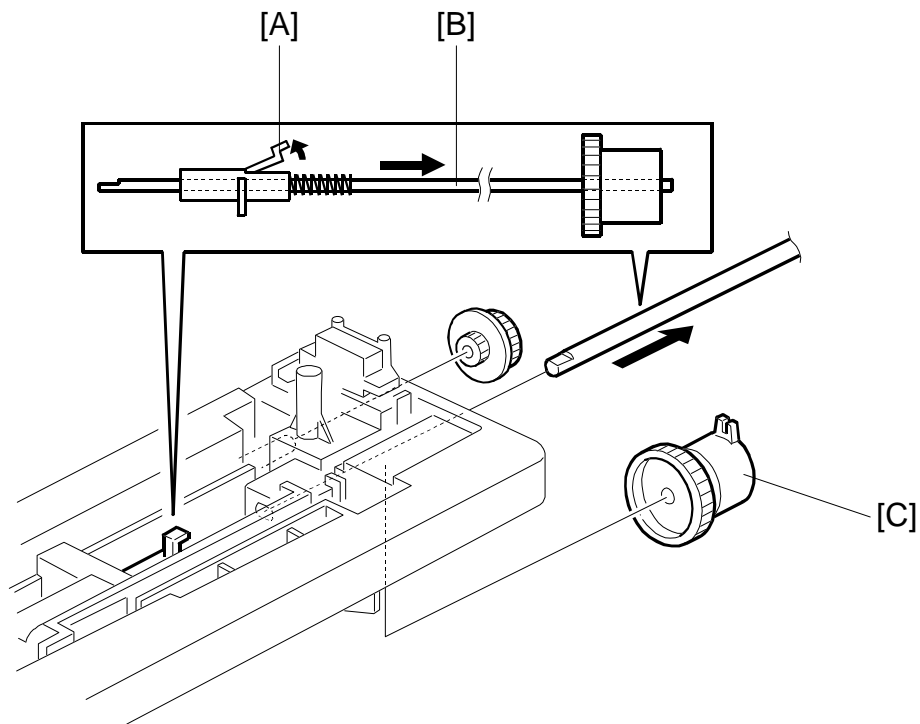
### 4.1.3 PAPER FEED MOTOR REPLACEMENT

Paper Feed  
Unit  
G914/G915



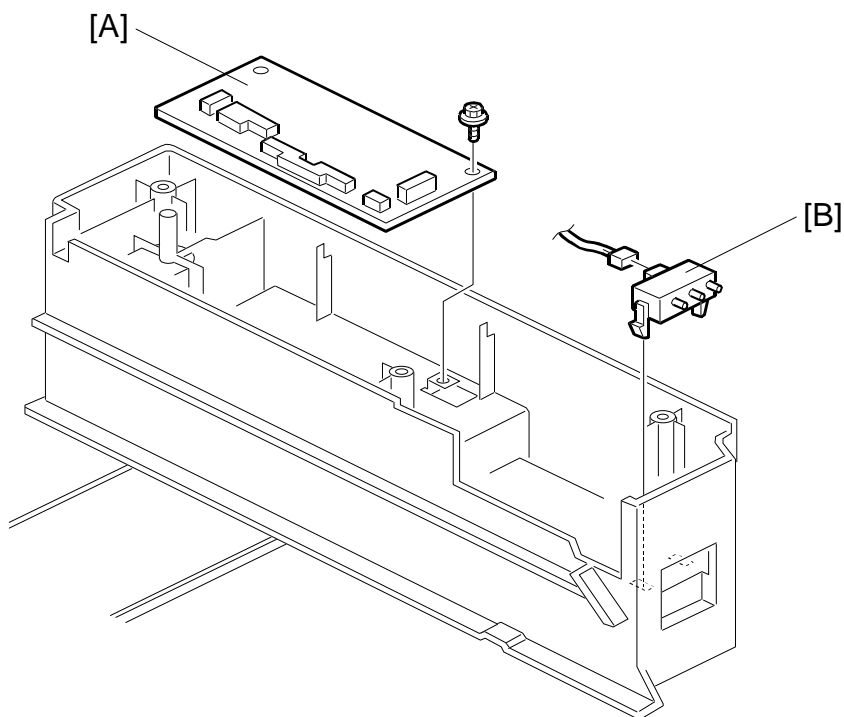
1. Remove the paper feed assembly. (Refer to Paper Feed Assembly Removal.)
2. Replace the paper feed motor [A] (2 screws).

#### 4.1.4 PAPER FEED CLUTCH REMOVAL



1. Remove the paper feed assembly. (Refer to Paper Feed Assembly Removal.)
2. Remove the paper feed roller. (Refer to Paper Feed Roller Replacement in the service manual for the main body.)
3. While unhooking the hooks [A], pull the shaft [B] out to the right, as shown.
4. Replace the paper feed clutch [C].

#### 4.1.5 PAPER FEED UNIT BOARD/PAPER SIZE SWITCH REPLACEMENT



##### ***Paper Feed Unit Board***

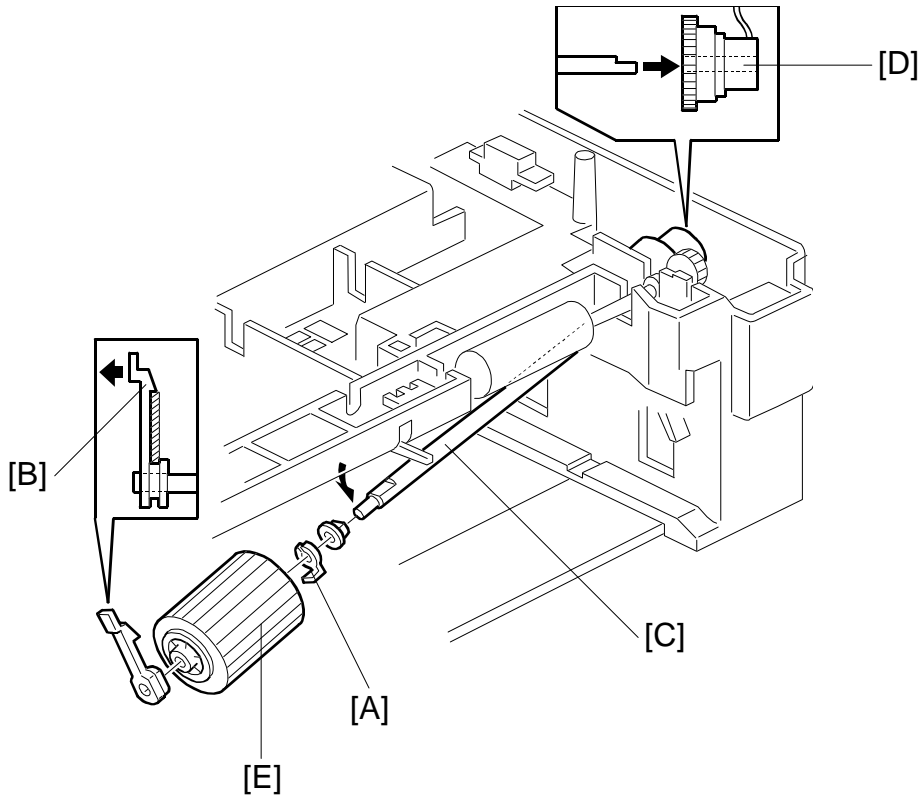
1. Remove the top cover. (Refer to Paper Feed Assembly Removal.)
2. Replace the paper feed unit board [A] (1 screw and 8 connectors).

##### ***Paper Size Switch***

1. Remove the top cover. (Refer to Paper Feed Assembly Removal.)
2. Replace the paper size switch [B] (1 connector).

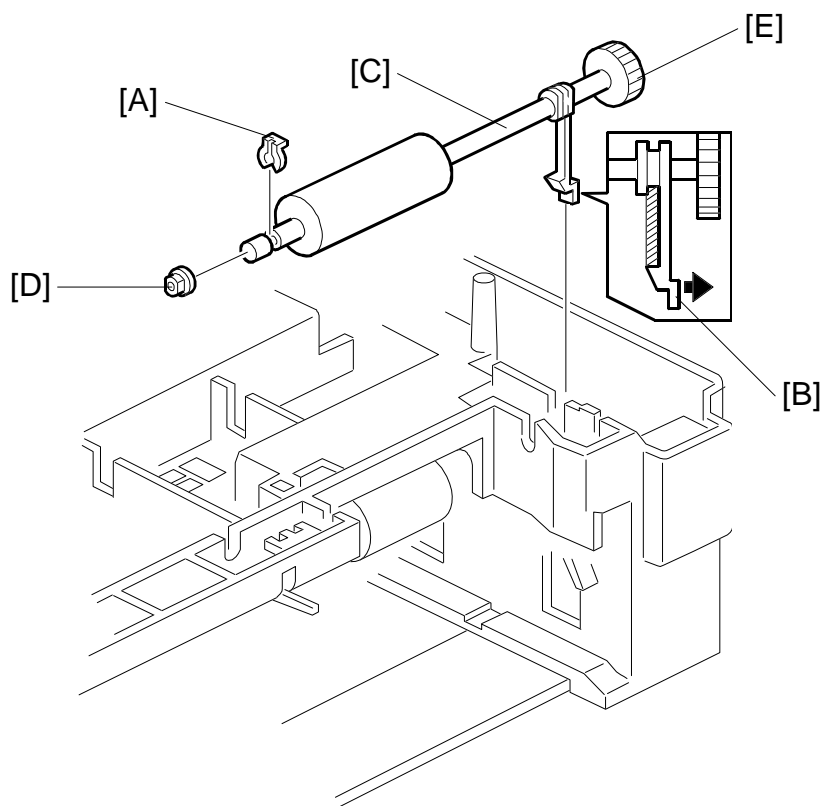
## 4.2 PAPER FEED UNIT (OPTION FOR G032)

### 4.2.1 PAPER FEED ROLLER/PAPER FEED CLUTCH REPLACEMENT



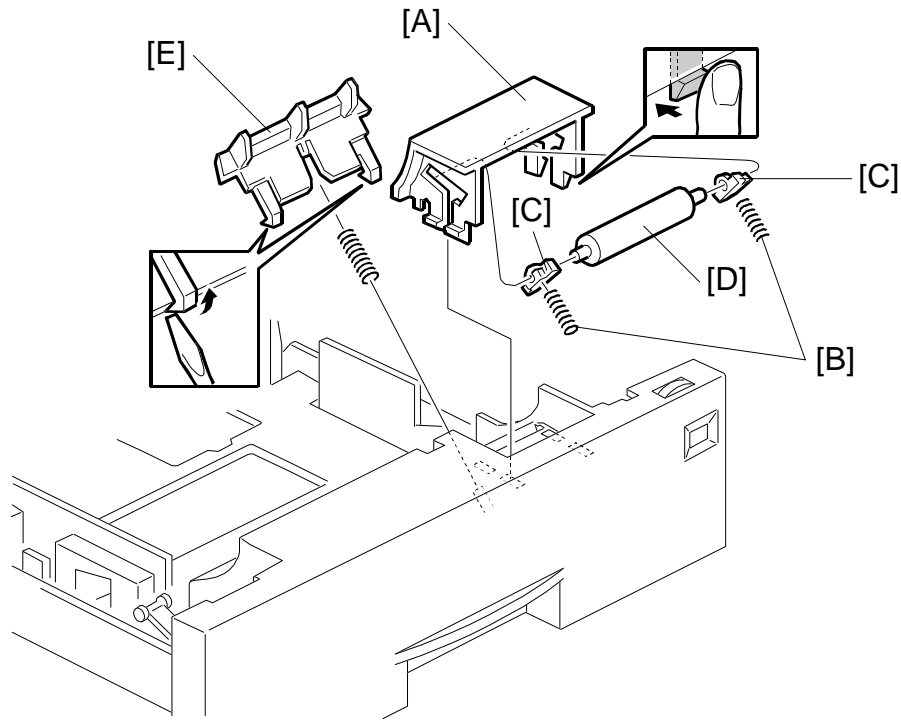
1. Draw out the paper cassette.
2. Remove the snap ring [A].
3. Release the lever [B] as shown.
4. Lower the shaft [C], then remove the paper feed clutch [D].
5. Replace the paper feed roller [E].  
Do not touch the paper feed roller with your bare hands.

## 4.2.2 PAPER DRIVE ROLLER REPLACEMENT



1. Draw out the paper cassette.
2. Remove the snap ring [A].
3. While releasing the lever [B], remove the paper drive roller assembly [C].
4. Replace the paper drive roller (bushing [D], gear [E], and lever [B]).  
Do not touch the paper drive roller with your bare hands.

### 4.2.3 DRIVE ROLLER IDLER/FRICTION PAD REPLACEMENT



#### ***Drive Roller Idler***

1. Draw out the paper cassette.
2. Remove the relay roller cover [A] (4 hooks).
3. Remove the two springs [B] and two bushings [C].
4. Replace the relay roller [D].

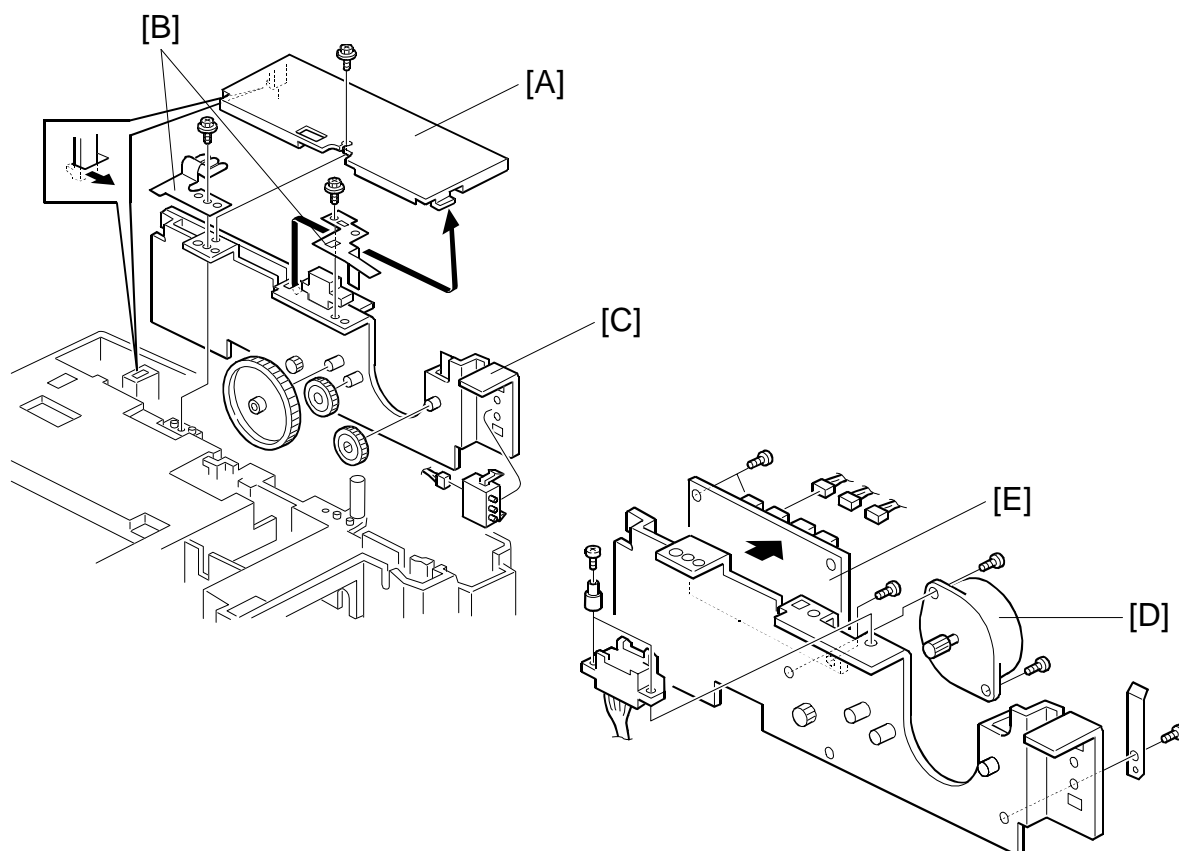
#### ***Friction Pad***

1. Draw out the paper cassette.
2. Replace the friction pad [E] (2 hooks and 1 spring).

Be sure to unhook the hooks. Otherwise, the hooks may be broken.

## 4.2.4 PAPER FEED MOTOR/PAPER FEED UNIT BOARD REPLACEMENT

Paper Feed  
Unit  
G914/G915



### ***Paper Feed Motor***

1. Remove the paper feed roller shaft. (Refer to Paper Feed Roller Replacement.)
2. Remove the paper drive roller assembly. (Refer to Paper Drive Roller Replacement.)
3. Remove the cover [A] (1 screw).
4. Remove the two grounding plates [B] (1 screw each).
5. Remove the paper feed motor assembly [C].
6. Replace the paper feed motor (2 screws) [D].

### ***Paper Feed Unit Board***

1. Remove the paper feed motor assembly [C]. (Refer to Paper Feed Motor Replacement.)
2. Replace the paper feed unit board [E] (2 screws and all connectors).

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA



# **NETWORK INTERFACE BOARD G919 TYPE 2000**

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

# 1. OVERALL MACHINE INFORMATION

## 1.1 SPECIFICATIONS

Item	Specification
Type	Internal Network Interface Board
Network Topology	Ethernet (10 Base-T) and Fast Ethernet (100 Base-TX)
Network Interface	RJ45 x 1
Protocols	IPX, TCP/IP, EtherTalk
SNMP Support	<ul style="list-style-type: none"><li>• IP and IPX SNMP support of MIB-2 and proprietary NIC MIB.</li><li>• SNMP support of standard MIB and proprietary printer MIBs on compatible printers.</li></ul>
Required Cable	STP (Shielded Twisted-Pair) cable Category Type 5 or better <b>Note:</b> A cable is not enclosed with this option.
Utility Software	<ul style="list-style-type: none"><li>• MAP (Management Access Protocol)</li><li>• IPX peer-to-peer printing</li><li>• IP peer-to-peer printing</li><li>• BOOTP (16-bit and 32-bit)</li><li>• NetWare setup utility</li></ul>
Other	<ul style="list-style-type: none"><li>• Built-in web server</li><li>• Built-in Telnet server</li><li>• Firmware update over an IPX or IP network</li></ul>

Network  
Interface  
Board G919

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## 2. INSTALLATION PROCEDURE

### 2.1 HARDWARE INSTALLATION

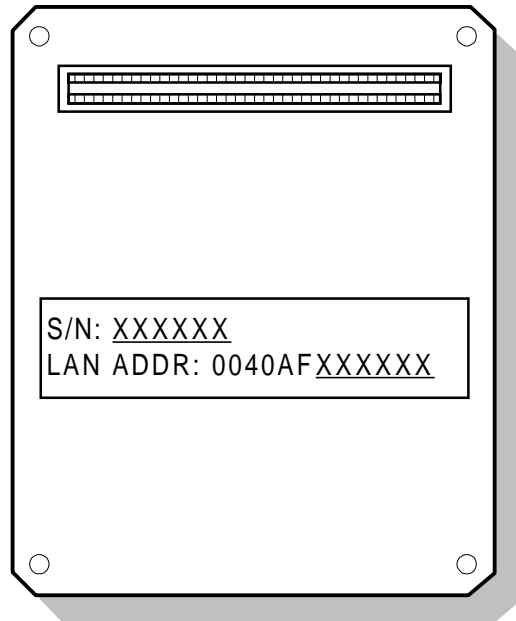
Refer to the base engine or printer controller installation instructions for how to install the network interface board.

#### 2.1.1 SERIAL NUMBER AND MAC ADDRESS

Check the serial number and MAC (Media Access Control) address that are printed on the network interface board (NIB).

The serial number is a 6-digit number, and is unique to each board.

The MAC address (LAN ADDR.) is a 12-digit hexadecimal number. The upper 6 digits are always “0040AF”, and the lower 6 digits are unique to each board.



#### 2.1.2 STATUS SHEET

By default, the NIB (network interface board) prints a status sheet every time after the machine is powered-up or the NIB has reset itself.

**NOTE:** Connect a network cable to the NIB before turning on the machine or resetting the NIB. Otherwise, the machine will take several minutes to print the status sheet, and the information on it may not be accurate.

Keep the status sheet with the machine, because it has the following information.

- Unit serial number
- Firmware version
- Network (MAC) address
- Network/Protocol information

## 2.2 PROGRAMMING NETWORK/PROTOCOL PARAMETERS

This section provides a summary of how to set up a network interface board in various network environments.

**NOTE:** It is not recommended for service technicians to program network and protocol parameters. Ask the customer's network administrator to program and manage these parameters.

### 2.2.1 IPX NETWORK

The following parameters are required for three types of IPX network printing. Use MAP (Management Access Program) or the NetWare Setup utility to program these parameters.

**NOTE:** 1) The MAP utility requires the Microsoft IPX/SPX compatible protocol stack on Windows 9x or Windows NT4.0, and a Web browser (Microsoft Internet Explorer 3.02 or later, or any version of Netscape Navigator). The "World Wide Web Publishing" service must be stopped before starting the MAP utility on the Windows NT server desktop.  
2) The NetWare Setup Utility requires the Novell 32-bit Client software on Windows 9x or Windows NT4.0.

Parameter	Peer-to-Peer Serverless Network	Novell 2.x/3.x/4.x Bindery Network	Novell 4.x NDS Network
Enable NetWare (Default = Yes)	Yes (Check the box)	Yes (Check the box)	Yes (Check the box)
Print Server Name	Yes	Yes	Yes
Print Server Password	No	Optional	Optional
Preferred File Server	No	Yes	No
Preferred NDS Context	No	No	Yes
Preferred NDS Tree	No	No	Yes
Print Queue Scan Rate (Default = 1 s)	No	Yes	Yes
Ethernet Frame Type (Default = Auto-Sense)	Yes	Yes	Yes
Disable Bindery (Default = No)	No	No (Uncheck the box)	Optional

**NOTE:** The preferred NDS context must be typed in without a starting dot ( . ).

- OU=Development.O=Corp [OK]
- .OU=Development.O=Corp [NG]
- Development.Corp [OK]
- .Development.Corp [NG]

n

## 2.2.2 TCP/IP NETWORK

### *TCP/IP Parameter Details*

The following TCP/IP parameters are required for TCP/IP network printing.

Parameter	Description	How to Change Parameters		
		Operation Panel/ BOOTPL	MAP/Web Browser	Telnet
IP Parameters				
IP Address	IP address of the NIB	Yes	Yes	Yes
Subnet Mask	Subnet mask for local subnet	Yes	Yes	Yes
Default Gateway	Gateway IP address	Yes	Yes	Yes
TCP Parameters				
Base Port Number	Port number to receive print jobs	No	Yes	Yes
DHCP Parameters				
Enable DHCP (Default = Yes)	<b>Yes</b> – The NIB obtains IP parameters from a DHCP server. <b>No</b> – IP parameters must be specified manually.	No	Yes	No
IP Address in NVRAM (Default = Yes)	<b>Yes</b> – Once the NIB has been assigned an IP address by a DHCP server, the NIB saves the address in the NVRAM and uses it permanently. <b>No</b> – The NIB tries to obtain IP parameters from a DHCP server every time the machine is turned on or the NIB is reset. The assigned IP address may not be the same every time.	No	Yes	No
LPD Parameters				
Enable LPD Banner (Default = No)	Enables or disables the LPD banner	No	Yes	Yes
Available PDLs for NIC Port	Available printer languages are automatically selected.	No	Yes	Yes

### ***Possible Problems with DHCP Parameter Settings***

1. IP address conflicts with another host  
If DHCP is enabled and an IP Address is saved in NVRAM, and the saved address conflicts with another host, the NIB does not show any errors. As a result, the NIB cannot receive any print jobs, because the IP protocol is disabled automatically at startup.

In this case, the other host in conflict with the NIB must have a manually assigned IP address. Find the host, using the ping and arp commands for example, and assign a correct address.

2. IP address changes after restarting the machine  
If DHCP is enabled but an IP address is not saved in the NVRAM, the NIB may have a different IP address from the one set before restarting the machine. As a result, the NIB cannot receive any print jobs, because the jobs are sent to the previously assigned IP address.

There are two solutions for this problem.

The first one is simply enable the "IP Address in NVRAM" parameter and assign a correct IP address. The second one is to reserve the IP address on the DHCP server for the NIB's Ethernet (MAC) Address.

### **2.2.3 ETHERTALK (APPLETALK) NETWORK**

The following parameters are required for AppleTalk networks. These parameters are automatically configured at startup as follows:

Parameter	Default Setting	How to change the parameter
AppleTalk Enable/Disable	Enabled	MAP, web browser and telnet.
Printer Name	Plug&Play name	See Note.
Zone Name	Default zone	See Note.

**NOTE:** 1) The Apple LaserWriter utility can change both the printer name and the zone name. The Apple Printer Utility can change the printer name only.  
2) Even if the printer name and zone name are changed with a utility, the changed names will be reset to the defaults at the next power-on, due to NIB-to-Controller interface limitations.

## 2.3 SETUP FOR VARIOUS NETWORK TYPES

### 2.3.1 PEER-TO-PEER NETWORK

#### ***Windows for Workgroups***

There is no guaranteed way to print directly to the NIB port. An alternative is to share a printer connected to an LPT port on a workstation.

**NOTE:** Net BEUI is not supported.

#### ***Windows 95/98***

The Peer-to-Peer printing software that is included with the NIB allows Windows 95/98 PC's to communicate directly with network attached printers. A network server, such as NetWare or Windows NT, is not required for Peer-to-Peer printing.

The Peer-to-Peer printing software must be installed on each PC that will use Peer-to-Peer printing. Once the Peer-to-Peer printing Software is installed, all NIBs on the network automatically appear in the list of available printer ports.

The Peer-to-Peer printing software can also be used in networks where servers are present; however, often the server printer services are utilized instead. Server based print services offer centralized printing management and spooling and do not require software (other than the printer driver) to be installed on each PC.

The Peer-to-Peer IPX and the Peer-to-Peer IP utilities install redirection to the NIB.

The Peer-to-Peer IPX port appears as "RDP\_XXXX" (XXXX is the board's serial number) by default.

The Peer-to-Peer IP port appears as "IP Address (10001)".

Both work as a local port of the host computer.

#### ***Windows NT (Workgroup Network)***

In addition to Peer-to-Peer IPX and Peer-to-Peer IP printing, Windows NT supports LPR printing using TCP/IP protocol.

Use the following parameters to set up an LPR port on an NT workstation.

- Name or address of the server providing lpd: IP Address of the NIB
- Name of the printer or print queue on that server: PORT1 (uppercase)

After installing a printer connected to the LPR port, share the printer for other workgroup members.



## 2.3.2 NOVELL NETWARE NETWORK

### ***Bindery Network***

Use the NetWare Setup utility to set up everything for NetWare printing in a single procedure.

Or, use PCONSOLE to set up printers, print queues, and print servers in the server bindery, then use MAP (Management Access Program) to setup NetWare parameters in the NIB.

**NOTE:** 1) The NetWare Setup utility requires Novell 32-bit client on Windows 9x or NT. Also, supervisor privileges are required to do the complete setup.  
2) The MAP utility requires the Microsoft IPX/SPX compatible protocol stack on Windows 9x or Windows NT4.0, and a Web browser (Microsoft Internet Explorer 3.02 or later, or any version of Netscape Navigator ).

### ***NDS Network***

Use the NetWare Setup utility to set up everything for NetWare printing in a single procedure.

Or, use PCONSOLE or NetWare Administrator to set up printers, print queues, and print servers in the server bindery, then use MAP (Management Access Program) to set up NetWare parameters in the NIB.

**NOTE:** The NIB does not support the “Notification” function on NetWare NDS networks.

## 2.3.3 TCP/IP NETWORK

### ***LPR/LPD Printing***

The NIB supports standard lpd. If a Windows or UNIX workstation has an lpr spooler, it can send print jobs to the NIB directly.

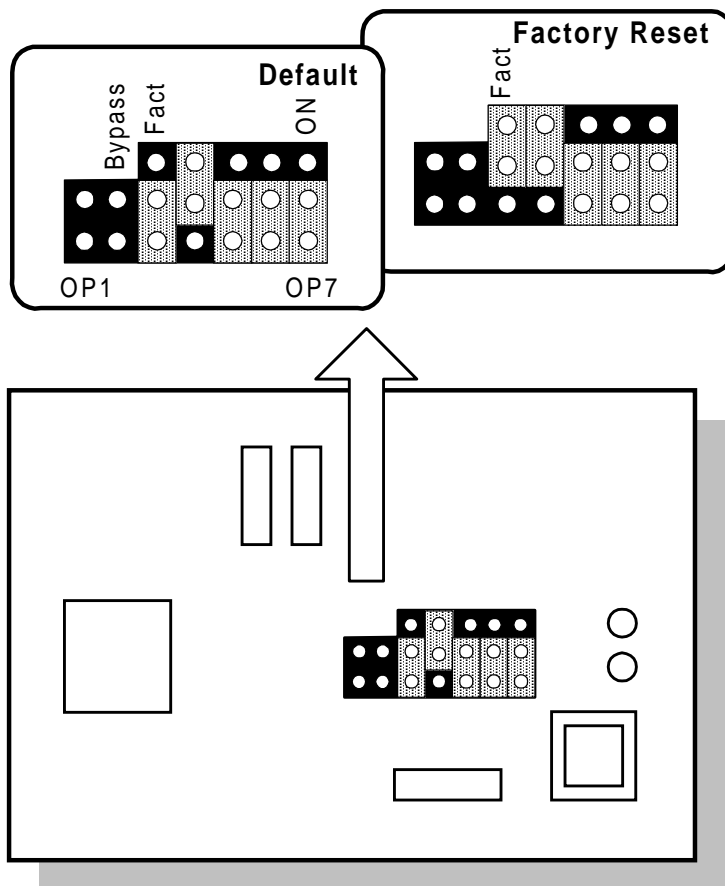
### ***FTP Printing***

This printer does not support FTP printing.

### 3. SERVICE TABLES AND PROCEDURES

#### 3.1 FACTORY RESET (NVRAM CLEAR)

When the machine or the network interface board has moved to a different location, reset the NVRAM contents to the factory defaults as follows.



1. Remove the network interface board and the NIB cover (4 screws). Then change the FACT jumper setting as shown above.
2. Install the network interface board and turn on the machine.
3. The green LED flashes 3 times, then the amber and green LEDs light alternately (once per second).
4. Turn off the machine and remove the network interface board.
5. Reset the jumper setting to the default, and reassemble the machine.
6. Turn on the machine.

## 3.2 FLASH ROM UPDATE

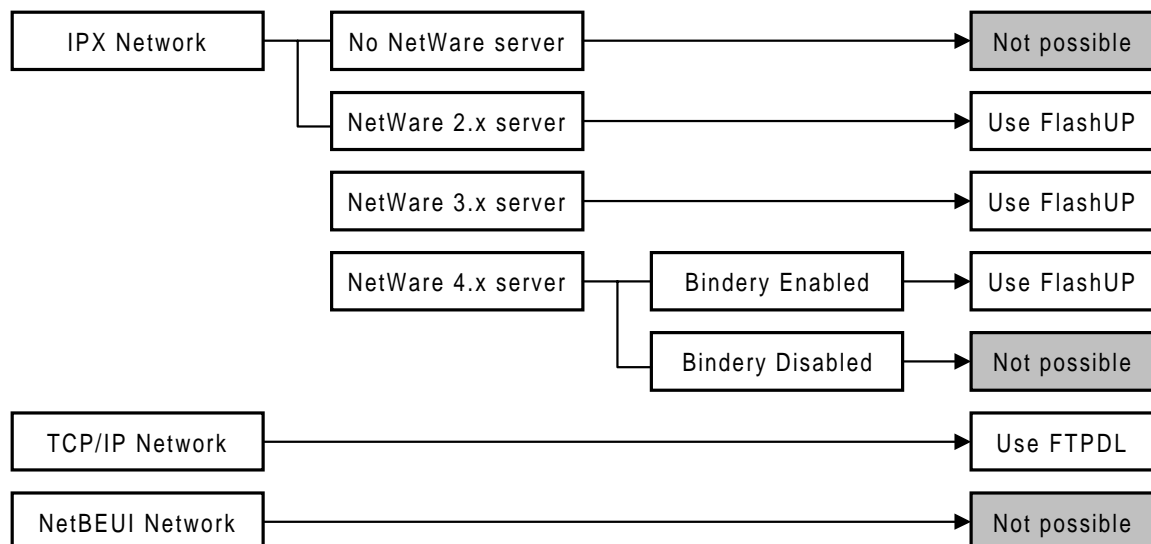
### 3.2.1 INTRODUCTION

Before you update network interface card firmware, you must obtain the latest firmware file and set up an update utility that is suitable for the network environment.

A firmware file (\*.upd, \*.upp, \*.upt, or \*.upu file) is normally distributed as a ZIP file (e.g., RIC221.ZIP). The update procedure is the same for each of these file types. Before starting the firmware update utility, you need to unzip the file to a temporary directory on a host computer.

Two types of utility software, FlashUP and FTPDL, are provided as 'ZIP' files with this document. Use the FlashUP utility for Novell server based IPX networks, or use the FTPDL utility for TCP/IP networks. You do not need to install both because they have the same function.

**NOTE:** Before using the FTPDL utility, the NIB must be configured with an IP address and subnet mask.



### 3.2.2 FLASHUP UTILITY (FOR NOVELL IPX NETWORKS)

#### **System Requirements**

- Windows 3.1x/95/98, Windows NT3.5x/4.0
- Novell compatible IPX protocol installed
- Novell compatible NetWare client software installed

#### **Network Requirements**

- NetWare 2.x/3.x/4.x server running in Bindery mode

#### **Installation Procedure**

1. Unzip Flash\_up.ZIP to a temporary folder (directory). The following files should be extracted there.

#### **FLASH\_UP.ZIP**

File size	Date	Time	Name
280,481	07-10-96	02:15:12	_INST16.EX_
8,192	09-07-95	20:22:40	_ISDEL.EXE
238,568	11-10-98	13:46:00	_SETUP.1
5,984	04-29-96	08:25:22	_SETUP.DLL
156,070	11-10-98	13:45:52	_SETUP.LIB
5	11-10-98	13:46:00	DISK1.ID
686	11-06-98	08:54:26	Readme.txt
44,608	07-24-96	04:00:00	SETUP.EXE
33	11-10-98	13:45:54	SETUP.INI
64,864	07-31-96	12:50:10	SETUP.INS
392	11-10-98	13:45:50	SETUP.ISS
166	11-10-98	13:45:58	SETUP.PKG
800,049 bytes			12 files

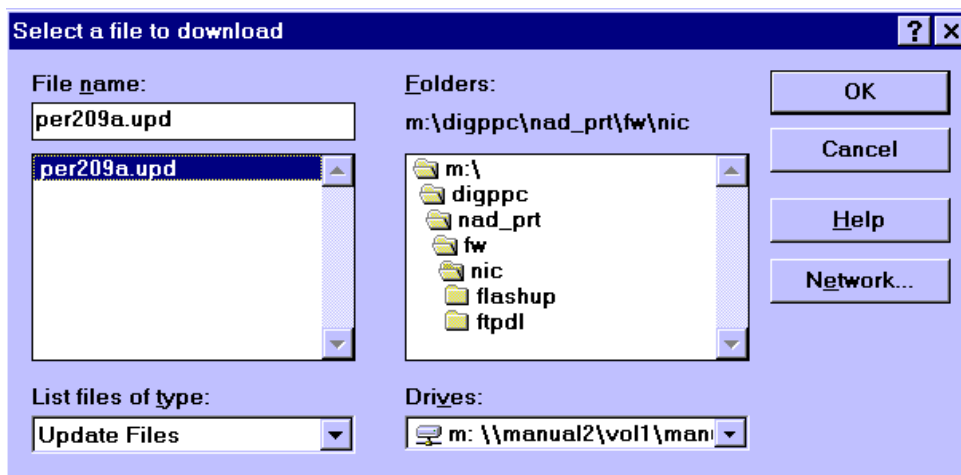
2. Run "Setup.exe" from the folder (directory).
3. Click "Next >" in the "Welcome" dialog box.
4. Read the readme.txt file displayed in the "Readme Information" dialog box, then click "Next >".
5. In the "Destination Location" dialog box, choose a folder (directory) to install the software, then click "Next >".
6. Confirm the program folder (group) name, then click "Next >".
7. After the software has been installed, click "Finish" in the "Setup Complete" dialog box.

**Firmware Update Procedure**

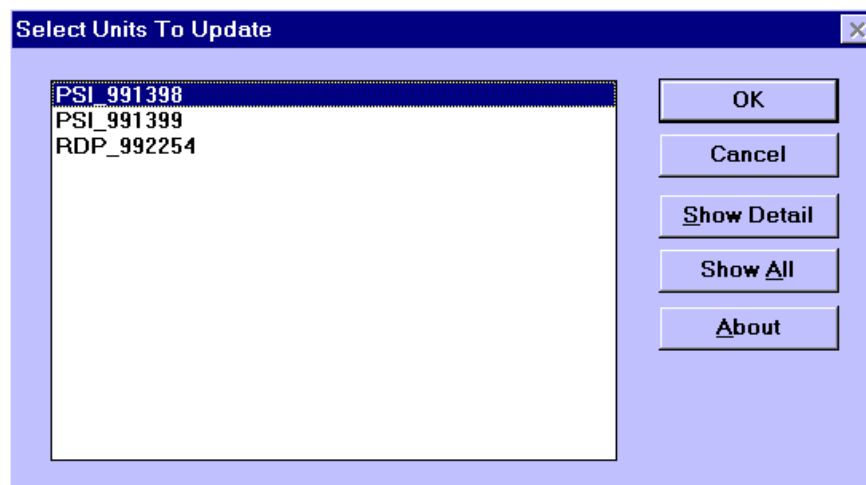
1. Login to the NetWare network as “supervisor” or a user with supervisor privileges.
2. Start the FlashUP utility.



3. Choose a new firmware file and click “OK”.



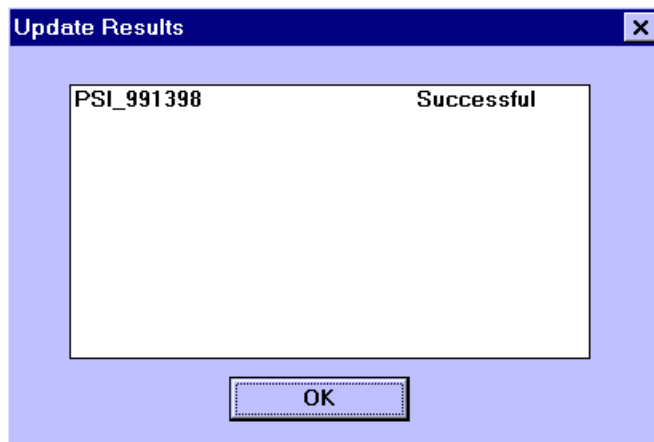
4. Choose a network interface card (or multiple cards) from the unit names listed in the dialog box, then click “OK”. The update will start.



5. If you do not see the desired unit in the list, click “Show All” to display all network interface cards that are currently logged in to the server. If you still cannot see the unit, click “Cancel”, restart the machine (printer), and try again.

## FLASH ROM UPDATE

6. After the firmware has been **downloaded** successfully, the following message pops up. Then click “OK” to finish.



7. The Print Server Card then updates its flash ROM. The machine will print a status report after the flash ROM update has finished.

**CAUTION:** Do not turn off the machine until after it prints a status sheet (after automatic re-initialization). Otherwise the, new firmware may not be programmed to the flash ROM successfully.

***Recovery from Failed Download***

Even if the firmware download has failed, a firmware download is still possible.

The NIB while in a “down” status appears as DWN\_xxx\_xxxxxx in the dialog box in step 4 above. Download the firmware again to the NIB in the “down” status using the FlashUp utility.

### 3.2.3 FTPDL UTILITY (FOR TCP/IP NETWORKS)

#### System Requirements

- Windows 3.1x/95/98, Windows NT4.0
- TCP/IP protocol installed

#### Network Requirements

- The target network interface board (NIB) must have a valid IP address.

**NOTE:** If the NIB is in the “DOWN” status, this utility cannot be used because no IP address is assigned to the NIB. Use the “Flashup” utility instead.

Network  
Interface  
Board G919

#### Installation

1. Unzip ftpdl.ZIP to a temporary folder (directory). The following files should be extracted there.

#### FTPDL.ZIP

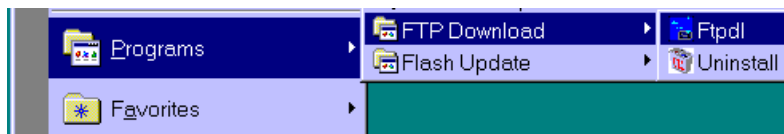
File size	Date	Time	Name
280,481	07-10-96	02:15:12	_INST16.EX_
8,192	09-07-95	20:22:40	_ISDEL.EXE
668,293	12-21-98	16:52:20	_SETUP.1
5,984	04-29-96	08:25:22	_SETUP.DLL
156,374	12-21-98	16:52:06	_SETUP.LIB
5	12-21-98	16:52:20	DISK1.ID
1,146	12-21-98	16:50:54	Readme.txt
44,608	07-24-96	04:00:00	SETUP.EXE
33	12-21-98	16:52:10	SETUP.INI
64,864	07-31-96	12:50:10	SETUP.INS
391	12-21-98	16:52:04	SETUP.ISS
226	12-21-98	16:52:20	SETUP.PKG
1,230,597 bytes			12 files

1. Run “Setup.exe” from the folder (directory).
2. Click “Next >” in the “Welcome” dialog box.
3. Read the readme.txt file displayed in the “Readme Information” dialog box, then click “Next >”.
4. In the “Destination Location” dialog box, choose a folder (directory) to install the software, then click “Next >”.
5. Confirm the program folder (group) name, then click “Next >”.
6. After the software has been installed, click “Finish” in the “Setup Complete” dialog box.

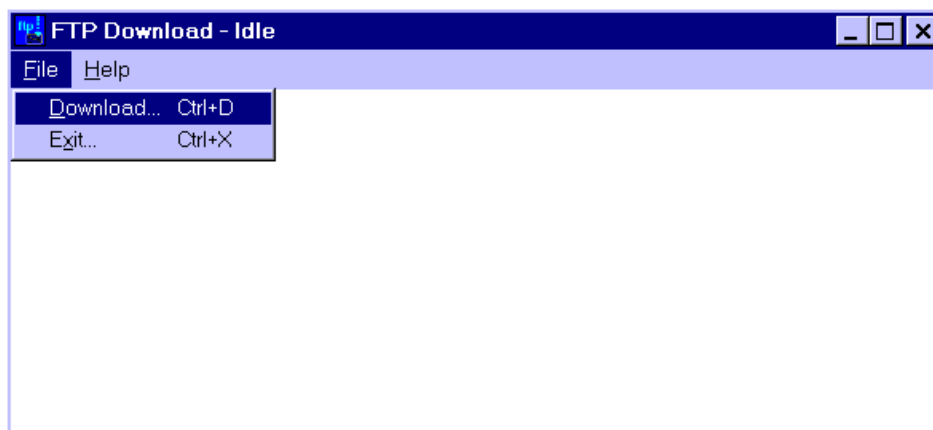
## FLASH ROM UPDATE

***Firmware Update Procedure***

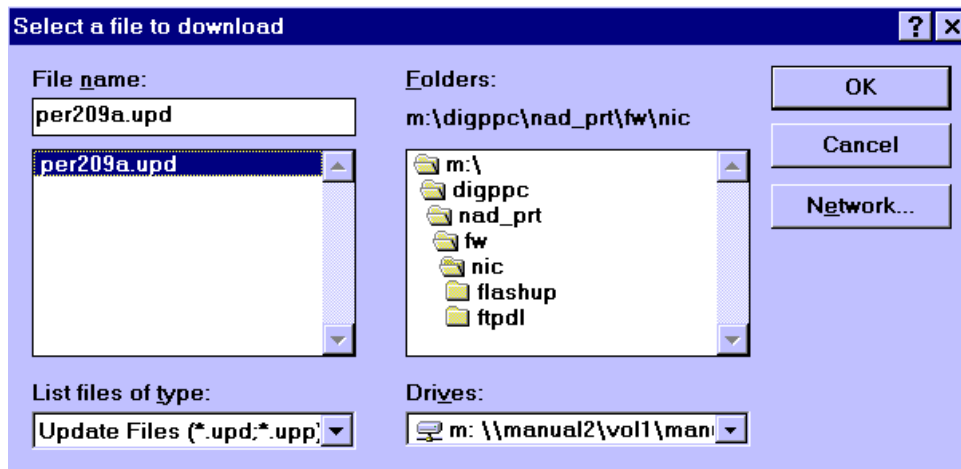
1. Start the FTPDL utility.



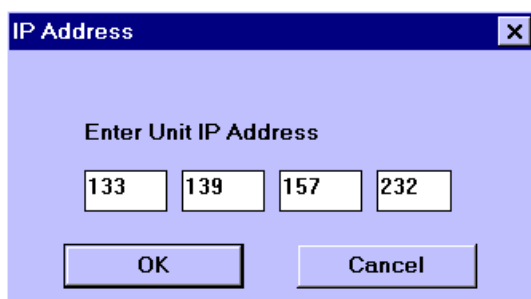
2. Choose [File] - [Download].



3. Choose a new firmware file and click "OK".

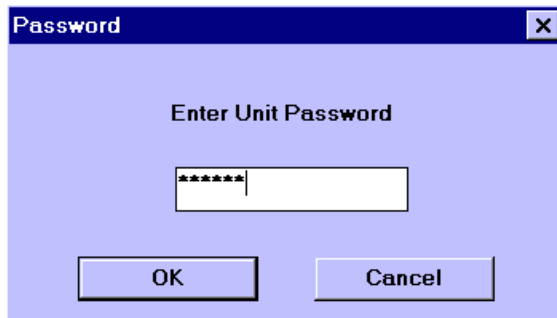


4. Enter the IP address of the network interface card in which you wish to update the firmware, then click "OK".



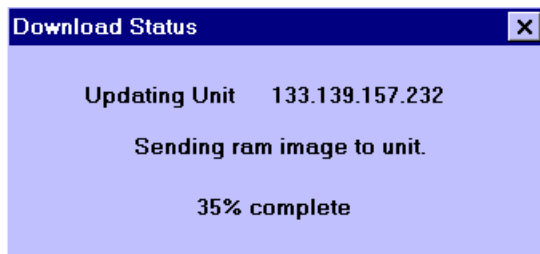


5. Enter the password programmed in the network interface card ("sysadm" is the default), then click "OK".



Network  
Interface  
Board G919

6. After sending the flash ROM image file to the network interface card, the card updates its firmware.



7. After the firmware has been downloaded, click "OK" to finish.



8. The Print Server Card then updates its flash ROM. The machine will print a status report after the flash ROM update has finished.

**CAUTION:** Do not turn off the machine until after it prints a status sheet.

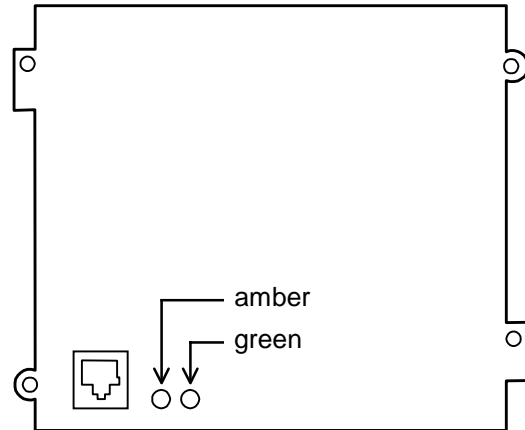
### ***Recovery from Failed Download***

If the firmware download using FTPDL has failed, use the FlashUP utility to recover the NIB. This is because the NIB may no longer contain the IP parameters after a failed download.

## 4. TROUBLESHOOTING

### 4.1 LED INDICATIONS

Two LEDs visible from the outside, one amber and one green, indicate the status of the network interface board (NIB). Refer to the diagram on the right for their location.




Amber (left)	Green (right)	Status	Condition(s)
Blinks	On	Normal	<ul style="list-style-type: none"> <li>The NIB is receiving a packet from the Ethernet.</li> </ul>
---	On	Normal	<ul style="list-style-type: none"> <li>The machine has just been turned on. The NIB then initializes itself.</li> <li>The NIB is waiting for a print job.</li> </ul>
---	Blinks 3 times, then stays on	Normal	<ul style="list-style-type: none"> <li>The NIB has finished initialization, and will print a status sheet.</li> </ul>
---	Blinks rapidly	Initialization Error	<ul style="list-style-type: none"> <li>The NIB detected a bad RAM chip during initialization.</li> <li>Turn the machine off and on. If the NIB detects the same error again, replace the NIB.</li> </ul>
Blinks for 10 s, then goes off	Blinks	Initialization Error	<ul style="list-style-type: none"> <li>The NIB detected a data error in the flash ROM (firmware) during initialization.</li> <li>Recover the firmware by downloading it through the network.</li> </ul>
---	Blinks rapidly 4 times, then off	Error	<ul style="list-style-type: none"> <li>The NIB detected an Ethernet hardware error.</li> <li>Check the Ethernet connections and restart the machine. If the error is frequent, try replacing the NIB.</li> </ul>
---	Blinks rapidly	Error	<ul style="list-style-type: none"> <li>The NIB has lost connection to the NetWare file server(s).</li> <li>Check the cable connection and the NetWare server status.</li> </ul>
Blink alternately		NVRAM reset	<ul style="list-style-type: none"> <li>The NIB has reset its NVRAM to the factory defaults. (Refer to section 3.1 for how to reset the NVRAM.)</li> </ul>

## 4.2 FIRMWARE HISTORY

G919 NIB FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
First release.	Rst538.upd	First Production	5.38
1. The field problem of poor performance with NetWare has been fixed. 2. CIDR is supported. 3. It is possible to select TCP/IP enable or disable.	Rst538.upd	April 2000 Production	5.55
1. IPP printing (v1.0) is supported. (See Note 1.) 2. AS400 problem in Australia—system hung up with remote print from AS400—has been fixed. (The countermeasure for NIB 450e has been included in NIB type 2000) 3. VAX/VMS problem—job remains in the queue after printing from VAX system—has been fixed. (The countermeasure for NIB 450e has been included in NIB type 2000) 4. IP fragmentation problem with token ring/Ethernet converter has been fixed. 5. It is possible to fix network speed at 100M or 10M bps.	Rst565a.upd	Jan. 2001 Production	5.65a
⇒ 1. NIB450E disconnects from network. 2. Socket Printing response interval (to FIN) reduced from 2sec to 100ms. 3. Memory size for the entire PostScript Banner increased from 120 bytes to 256 bytes. This is for the entire Banner, which includes the host name, user name and file name. 4. Ghost server problem: Multicast hash table used for Ethernet driver. This allows only specific AppleTalk multicasts instead of all multicasts, preventing the NIC from crashing during multicast storms.  Other changes: Software modified to support WINS.	Rst572b.upd	Oct. '01 Production	5.72b

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G919 NIB FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
 <ol style="list-style-type: none"> <li>1. Network connection is broken.</li> <li>2. Panel freezes when multiple buttons are pressed continuously.</li> </ol> <p>Other changes:</p> <ol style="list-style-type: none"> <li>1. The following IP protocols can be enabled/disabled: HTTP, Telnet, FTP, SNMP, IPP, LPR, and Rawsocket.</li> <li>2. SNMP Community name can be changed.</li> <li>3. SAP interval can be changed.</li> <li>4. Software now supports NetWare 6.</li> <li>5. SNMP security improved (CERT test path).</li> </ol>	Rst576c.upd	Sept. '02 Production	5.76c

**Note 1: IPP printing**

Only G049 and G054 support this feature. (not supported by G031/G032)

Windows 2000 or Windows 98/ME allow IPP printing. IPP client program must be installed in Windows 98/ME before using the feature. The IPP client program, WPNPINS.exe, is on the Microsoft Web site.

With the Add printer wizard, an IPP port can be specified as follows:

URL) <http://XXX.XXX.XXX:631/Print> XXX is the IP address of the printer.

**Note 2: Network speed**

The network speed can be fixed at 100Mbps or 10Mbps by built-in web browser.

Be aware that the machine will never communicate with the host if the wrong network speed has been set by accident.

# **G049/G054**

# **SERVICE MANUAL**

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA

# 1. OVERALL MACHINE INFORMATION

## 1.1 SPECIFICATIONS

**NOTE:** The new information for the G049/G054 is underlined in bold face.

Printing Speed:  
(600 dpi)

G049:  
Maximum **21** pages per minute (A4/LT LEF)  
G054:  
Maximum **16** pages per minute (A4/LT SEF)

Printer Language:

PCL6/PCL5e  
Compatible with **Laser Jet 4000/5000** driver and printer.  
Windows 3.1x/9x, Windows NT4.0/**2000** drivers is available.  
PostScript Level II  
Windows 3.1x/9x, Windows NT4.0/**2000** drivers and  
Macintosh (OS 7.5 or later) is available.

Printing Paper Weight

Paper tray: 60 – **90** g/m<sup>2</sup>, 16 – **24** lb.

Power Source:

G049  
120 V, 60 Hz: More than **6.6 A** (for North America)  
220 – 240 V, 50/60 Hz More than **3.5 A** (for Europe)  
G054  
120 V, 60 Hz: More than **4.7 A** (for North America)  
220 – 240 V, 50/60 Hz More than **2.4 A** (for Europe)

Power Consumption:

	<b>G049</b>	<b>G054</b>
Maximum	795 W or less	<b><u>560</u></b> W or less
Printing	<b><u>510</u></b> W or less	380 W or less
Energy Saver	30 W or less	<b><u>15</u></b> W or less

Noise Emission (All Options Installed):

Sound Power Level:

	G049		G054	
	US	EU	US	EU
Printing	64 dB or less	63 dB or less	<b><u>62</u></b> dB or less	<b><u>61</u></b> dB or less
Stand- by	<b><u>47</u></b> dB or less	<b><u>46</u></b> dB or less	<b><u>47</u></b> dB or less	<b><u>47</u></b> dB or less

**NOTE:** The above measurements were made in accordance with ISO 7779 from the operators' position.

Memory: Standard **16 MB, up to 80 MB with optional DIMM.**

**NOTE:** Both G049 and G054 are equipped with one DIMM slot.

G049/G054

- Utility Software
1. Printer Drivers
  2. PS PPD Files
  3. Font manager
  4. Aficio Manager
  5. Operating Instructions (G049/G054 – 22, 27)
  6. **Port Navi**

## 1.2 MACHINE CONFIGURATION

### Internal Options

No.	Item	Machine Code
H	<b><u>Printer Feature Expander Type 185 32MB</u></b>	<b><u>G688 - 10</u></b>
I	<b><u>Printer Feature Expander Type 185 64MB</u></b>	<b><u>G688 - 11</u></b>



## 2. DETAILED SECTION DESCRIPTIONS

### 2.5 PAPER FEED

#### 2.5.1 OVERVIEW G054

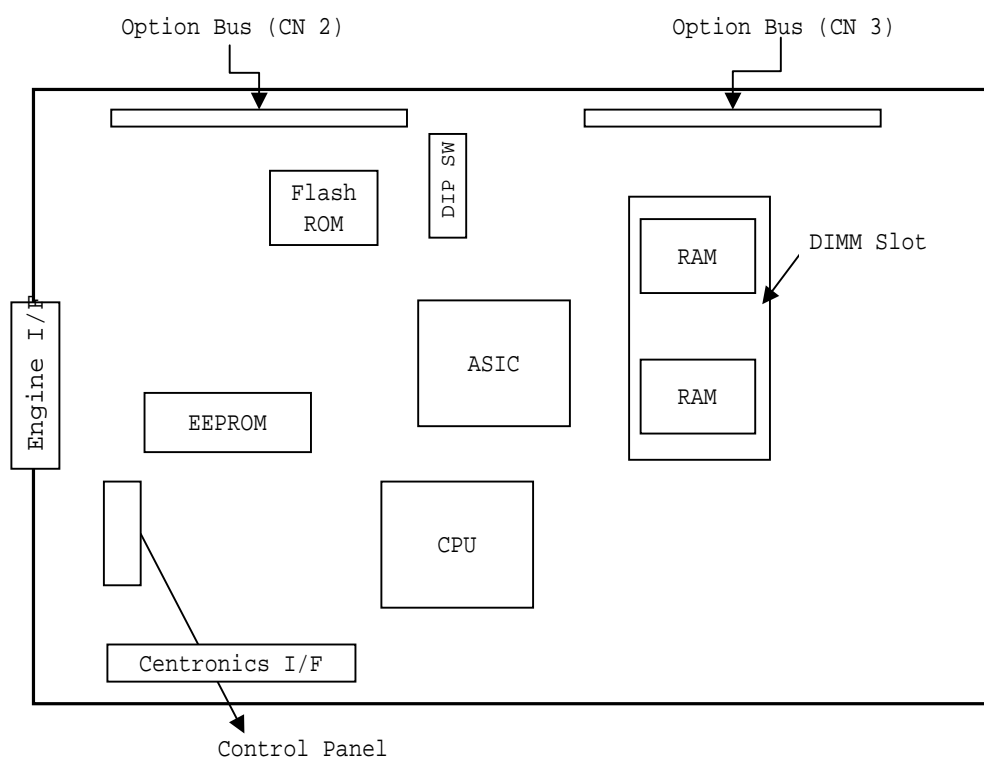
The built-in tray for the G032 can only hold A4/letter size. However, the G054 tray can handle A4/letter or shorter.

The paper feed speed for the G049/G054 is the same as that of the G031/G032. However, the feeding interval has been decreased in the G049/G054, allowing a higher PPM.

### 2.10 PRINTER CONTROL BOARD

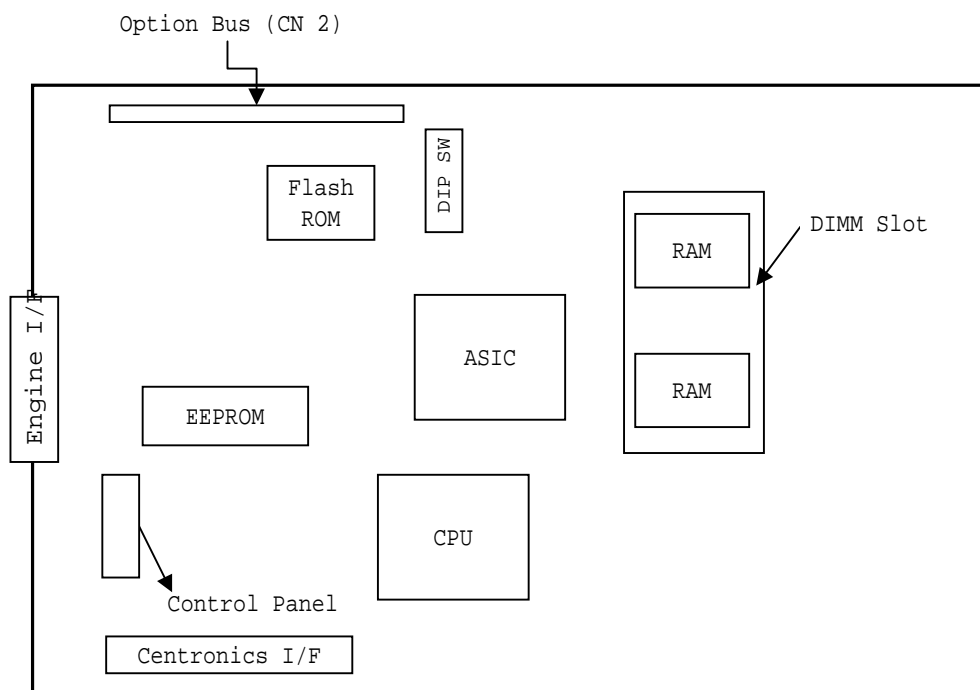
#### PCB LAYOUT

##### G049



G049/G054

**G054**



## 2.10.2 DEVICES

Devices	Description																			
CPU	133 MHz VR4310																			
ASIC: ROCKY Z	Memory map control																			
	Reset signal																			
	DRAM control																			
	DMA control																			
	FCI control (edge smoothing, toner saving)																			
	Interrupt control																			
	Engine serial communication control																			
	Interval control																			
	Centronics I/F																			
	I/O port																			
Code ROM	Flash ROM (2 MB) 32 bit																			
DRAM	16 MB (16 bit DRAM × 2)																			
EEPROM	2 KB (NVRAM)																			
Centronics I/F	Bi-directional parallel interface (standardized by IEEE 1284)																			
Option I/F	G049: 2 slots RS232C Ethernet (100 Base-Tx, 10 Base-T) Hard disk drive IC Card adapter for up-dating controller firmware (CN 3)																			
	G054: 1 slot RS232C Ethernet (100 base-Tx, 10 Base-T) Hard disk drive IC Card adapter for up-dating controller firmware																			
Optional RAM I/F	DIMM × 1 slot, 32 or 64 MB DIMM																			
DIMM I/F	1 slot																			
DIP SW	<div><div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div></div><div></div><div></div><div></div></div><div>- OFF -</div></div><table><tr><th>SW No.</th><th>Setting</th><th>Description</th></tr><tr><td rowspan="2">1</td><td>OFF</td><td>Booting from Flash ROM</td></tr><tr><td>ON</td><td>Booting from IC Card</td></tr><tr><td>2</td><td></td><td>Not used</td></tr><tr><td>3</td><td></td><td>Not used</td></tr><tr><td rowspan="2">4</td><td>OFF</td><td>Paper handling of the By-Pass- By-Pass tray size select in drive is used regardless of paper size set by Op Pane.</td></tr><tr><td>ON</td><td>By-Pass print available only for the same set by the Op Panel.</td></tr></table><div>Requires Controller firmware version 1.35 or newer.</div></div>	SW No.	Setting	Description	1	OFF	Booting from Flash ROM	ON	Booting from IC Card	2		Not used	3		Not used	4	OFF	Paper handling of the By-Pass- By-Pass tray size select in drive is used regardless of paper size set by Op Pane.	ON	By-Pass print available only for the same set by the Op Panel.
SW No.	Setting	Description																		
1	OFF	Booting from Flash ROM																		
	ON	Booting from IC Card																		
2		Not used																		
3		Not used																		
4	OFF	Paper handling of the By-Pass- By-Pass tray size select in drive is used regardless of paper size set by Op Pane.																		
	ON	By-Pass print available only for the same set by the Op Panel.																		

G049/G054

### 3. G049/G054 FIRMWARE HISTORY

#### ⇒ 3.1 G049 ENGINE FIRMWARE MODIFICATION HISTORY

G049 ENGINE FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
First Mass Production	G0295172	1st mass Production	0.04

#### ⇒ 3.2 G054 ENGINE FIRMWARE MODIFICATION HISTORY

G054 ENGINE FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
First Mass Production	G0305157B	1st mass Production	1.00
To meet EMI standard, the fusing temperature control was changed.	G0305157C	July 2000 Production	1.01
Condition	Power on		
	Within 2 minutes	After 2 minutes	
Ready to print (old)	170	170	
Ready to print (new)			
600dpi	164	164	
1200dpi	135	135	
Standby mode (old)	175	165	
Standby mode (new)			
600dpi	164 - 173	133 - 173	
1200dpi	135 – 145	105 - 145	

### 3.3 G049 CONTROLLER FIRMWARE MODIFICATION HISTORY



G049 CONTROLLER FIRMWARE MODIFICATION HISTORY			
DESCRIPTION OF MODIFICATION	FIRMWARE LEVEL	SERIAL NUMBER	FIRMWARE VERSION
<ul style="list-style-type: none"> <li>Initial Production</li> </ul>	G0495910 <b>A</b>	1st Mass Production	1.11
<ul style="list-style-type: none"> <li>When using PCL5e, the right side line of a table is not printed.</li> <li>In the condition of Word 2000/PCLXL/1200dpi, images created by WordArt are not printed correctly.</li> <li>PS fonts download to HDD slowly.</li> </ul>	G0495910 <b>B</b>	Jan. 2001 Production	1.29
<ul style="list-style-type: none"> <li>Printing stalls when using the PS driver under Windows XP.</li> </ul>	G0495910 <b>D</b>	Production Discontinued	1.36
<ul style="list-style-type: none"> <li>Added Euro Symbol Sets PC858, Latin 9, and Roman 9.</li> <li>Added Euro currency codes to existing symbol sets MC Text and PS Math.</li> <li>Changed symbol sets Win3.1 Latin1 8E, 9E, and Win 3.1 Baltic FF so that they appear on outputs the same as with HP printers.</li> </ul>	G0495910 <b>E</b>	Production Discontinued	1.38

G049/G054

### ⇒ 3.4 G054 CONTROLLER FIRMWARE MODIFICATION HISTORY

<b>G054 CONTROLLER FIRMWARE MODIFICATION HISTORY</b>			
<b>DESCRIPTION OF MODIFICATION</b>	<b>FIRMWARE LEVEL</b>	<b>SERIAL NUMBER</b>	<b>FIRMWARE VERSION</b>
<ul style="list-style-type: none"> <li>Initial Production</li> </ul>	G0545910 <b>A</b>	1st Mass Production	1.11
<ul style="list-style-type: none"> <li>When using PCL5e, the right side line of a table is not printed.</li> <li>In the condition of Word 2000/PCLXL/1200dpi, images created by WordArt are not printed correctly.</li> <li>PS fonts download to HDD slowly.</li> </ul>	G0545910 <b>B</b>	Nov.2000 Production	1.29
<p>The paper handling of the by-pass tray can be selected by Dip SW 4.</p> <ul style="list-style-type: none"> <li>Dip SW 4: Off (Default) When the by-pass tray is selected by driver, the paper size selected by driver is available regardless of the paper size set by the operation panel.</li> <li>Dip SW 4:On The print is available only when the paper size selected by driver is the same as that set by the operation panel. (This is the way the the machine worked prior to the modification.)</li> </ul>	G0545910 <b>C</b>	June 2001 Production	1.35
<ul style="list-style-type: none"> <li>Printing stalls when using the PS driver under Windows XP.</li> </ul>	G0545910 <b>D</b>	Production Discontinued	1.36
<ul style="list-style-type: none"> <li>Added Euro Symbol Sets PC858, Latin 9, and Roman 9.</li> <li>Added Euro currency codes to existing symbol sets MC Text and PS Math.</li> <li>Changed symbol sets Win3.1 Latin1 8E, 9E, and Win 3.1 Baltic FF so that they appear on outputs the same as with HP printers.</li> </ul>	G0545910 <b>E</b>	Production Discontinued	1.38

## APPENDIX

### Downloading Controller Firmware for G031/G032

**NOTE:** In the following section the G031/G032 printer is occasionally referred to as the “Stinger”. This reference will be seen in computer screen captures and in various documentation throughout this section. The Stinger P3 = G031 and the Stinger P4 = G032.

**NOTE:** The Appendix is designed to be used in conjunction with material found in sections 4.3 through 4.6 of the Service Manual.

CÓPIA NÃO CONTROLADA

CÓPIA NÃO CONTROLADA



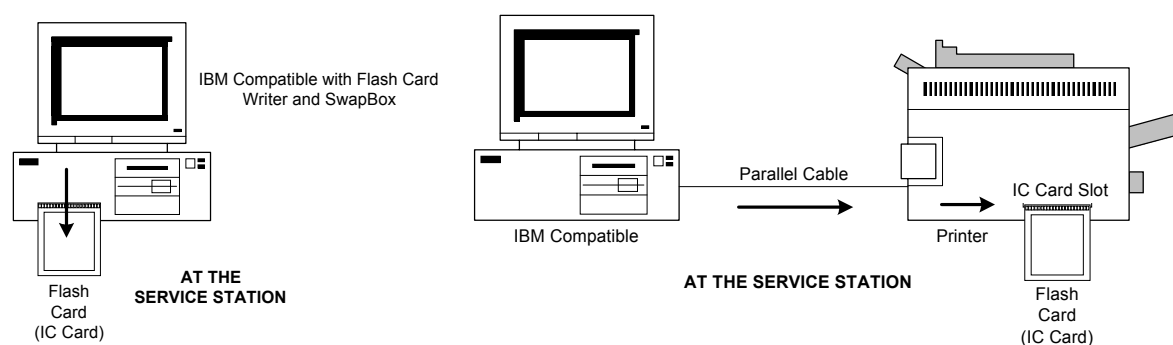
# 1. DOWNLOADING CONTROLLER FIRMWARE

## 1.1 OVERVIEW

This appendix describes the methods available to upgrade the controller firmware. There are three basic methods.

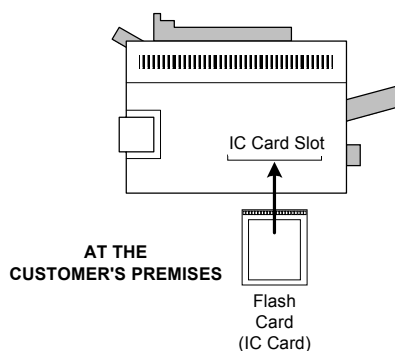
### 1.1.1 IC CARD (FLASH CARD)

First, new firmware has to be stored in the IC card. There are two ways to do this.



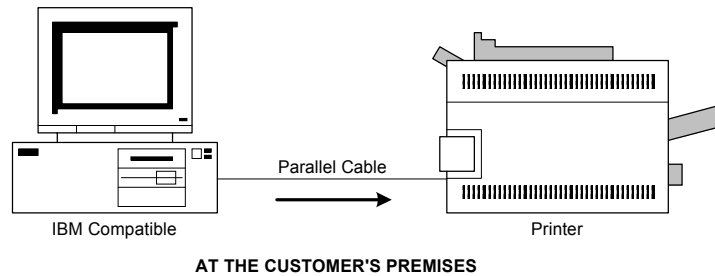
- Using a flash card writer and SwapBox
- Copying to an IC card plugged into a G031 or G032 printer via a parallel cable, using either the DOS copy /b command or the Stinger downloading utility.

Then, the IC card is taken to the customer's premises, and downloaded using a service mode.

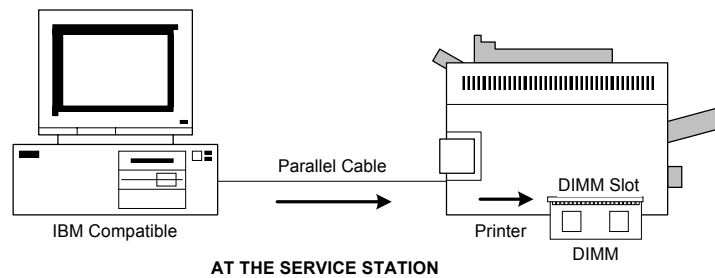


The IC card is available as a service tool.

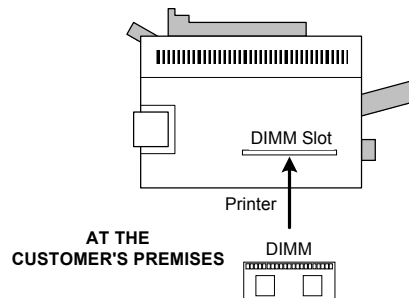
## OVERVIEW

**1.1.2 PC, VIA PARALLEL PORT**

At the customer site, new firmware can be downloaded to the printer from a PC via a parallel cable using either the DOS copy /b command or the Stinger downloading utility.

**1.1.3 DIMM**

First, the new firmware must be stored on an 8 MB DIMM. This is done by copying the firmware from a PC to a DIMM plugged into a G032 or G032 printer via a parallel cable, using either the DOS copy /b command or the Stinger downloading utility.



Then, the IC card is taken to the customer's premises, and downloaded using a service mode.

The DIMM card is available as a service tool.

### ⇒ 1.1.4 DIMM (GO49/G054)

The DIMM ROM, used for downloading controller firmware, is not supported by the G049/G054. There are 2 ways to upgrade the controller firmware:

1. Using the IC card (flash card).
2. Using a PC (via parallel port)

### 1.1.5 RELEASING NEW CONTROLLER FIRMWARE

Two controller firmware files will be released (e.g. P3card.rom and P4card.rom). This firmware can be copied to an IC card using the Swapbox utility.

To download firmware from a PC to the printer, a byte-swapping operation must be performed on the released firmware. To do this, use the Byte Swap button of the SSU (Stinger Service Utility) program. This creates new files, e.g., P3carddown.rom and P4carddown.rom.

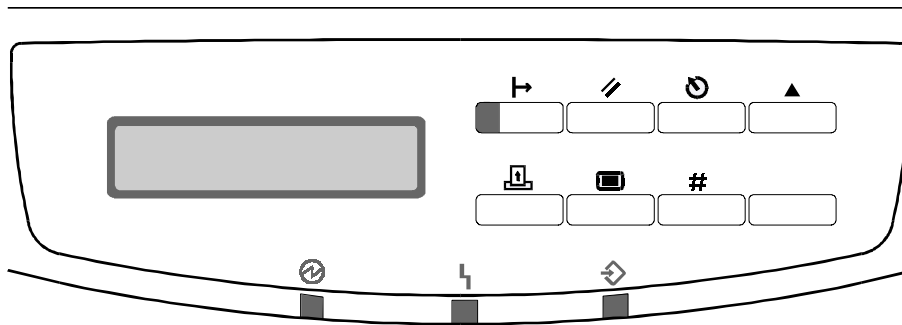
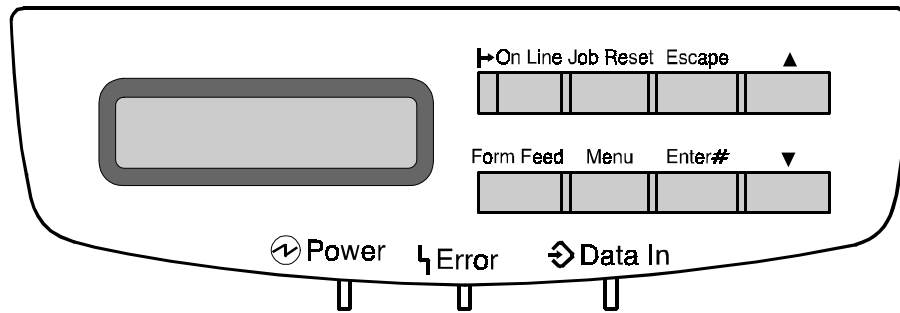
To summarize:

- To use the Swapbox utility: Use the released firmware file (\*card.rom)
- To copy to an IC card or DIMM plugged into the printer (from a PC through a parallel cable): Use the byte-swapped file (\*carddown.rom - created by SSU byte swap)
- To copy directly to the printer's firmware flash ROM (from a PC through a parallel cable): Use the byte-swapped file (\*carddown.rom - created by SSU byte swap)

## SERVICE TOOLS

**1.2 SERVICE TOOLS****1.2.1 OPERATION PANEL**

The locations of the keys on the operation panel are shown below.



## 1.2.2 SERVICE TOOL MENUS

There are two service menus that include tools for downloading firmware. These are the IC card boot service menu and the service tool menu.

### *IC Card Boot Service Menu*

#### *Entering This Menu*

1. Turn the printer off.
2. Turn on DIP SW 1 on the printer control board.
3. Plug the IC card into the IC card adapter, then connect it to the option bus connector on the printer control board.  
**NOTE:** The G031 has two option bus connectors. The left connector can only be used for this function.  
 Do not use a blank IC card.
4. Turn the printer on. The IC card boot service menu will be displayed.

#### *Menu Contents*

The IC card boot service menu contains the following features.

Menu	Function
Update Firmware	Update controller firmware using an IC card.
	For details, see this appendix, and “Downloading New Controller Software” in section 4 of the service manual.
Download Firmware	Downloading firmware into the printer’s flash memory from a PC through a parallel cable.
	See this appendix for details.
Copy to DIMM	Download firmware to a DIMM card from a PC through a parallel cable.
	See this appendix for details.
Copy to CARD	Download firmware to an IC card from a PC through a parallel cable.
	See this appendix for details.
Clear NVRAM	Clear the NVRAM
	To clear the NVRAM, press the “Enter” key twice. Normally, NVRAM clear should not be used. <b>Note:</b> This resets all the settings stored in the NVRAM to their default settings. This procedure is required only after replacing the NVRAM chip.
TEST Print	Print controller generated test pattern (Listed below – for factory use only)

## SERVICE TOOLS

## TEST Print menu

Sub menu	Function
Repeat	Repeat latest action
Total Pattern	Print total pattern
2 x 2	Print 2 x 2 dots pattern for uniformity
4 x 4	Print 4 x 4 dots pattern for uniformity
Brown Fox	Print "Brown Fox" words
Flag Ship	Print checker pattern and black square
Fox Pattern	Print "Brown" words and black square
Blank	Print all blank data
Real 1,200 dpi	Print total pattern by 1200dpi
Regist Adjustment	Adjust main/sub registration
Free Size	Print 2 x 2 pattern on free size paper
Header Attach	Print with header dpi : 600 dpi/1,200 dpi/real 1,200 dpi Paper : Thick/Normal/Special sheet Tray : CS-S standard cassette : CS-1 second tray : CS-2 third tray : CS-M bypass tray Page : number of prints
EEPROM Clear	Clear the EEPROM on the ECB (Factory use)
Clear Counter	Clear the counters (Factory use)
Version Info	View the software version of pattern generator.

*Exiting This Menu*

1. Turn the printer off.
2. Remove the IC card and IC card adapter.
3. Turn DIP SW 1 to off.
4. Turn on the printer again.
5. Then, the user menu will appear.

**NOTE:** Don't forget to return DIP SW1 to the off position. Otherwise the printer will not boot.

**Service Tool Menu****Entering This Menu**

1. Turn off the printer.
2. Turn on the printer again while pressing the “On Line” and “Menu” keys together.
3. The service tool menu will be displayed.

**NOTE:** An IC card is not required to boot up to the service tool menu.

**Menu Contents**

Menu Item	Contents
Factory Test Pattern	This is the same as in the IC card boot service menu.
Downloading	This is the same as in the IC card boot service menu.
Clear NVRAM	This is the same as in the IC card boot service menu.
Copy to CARD	This is the same as in the IC card boot service menu.
DIMM to Memory	Downloads from a DIMM card plugged into the printer into the flash memory.

**1.2.3 STINGER SERVICE UTILITY (SSU)**

To download firmware from a PC to the printer, SSU running on a Windows PC can be used.

**NOTE:** Use only the “Download” menu and “Byte Swap” buttons. The other buttons are for designer use only.

- a) Download button:  
Downloads new controller firmware into the printer.
- b) Byte Swap menu:  
Makes a byte-swapped file for downloading from PC to printer via a parallel cable.

SSU will be provided as an SSU.ZIP file. The SSU.ZIP includes seven files, as follows:

- download.hed
- gzip.exe
- Paiview.exe
- Pindump.exe
- stinger.exe
- stinger.ico
- Xpaipal.smp

## 1.3 USING AN IC CARD

### 1.3.1 PREPARING THE IC CARD

#### *Two Methods*

There are two ways to do this:

- Swapbox
- Copy to an IC card plugged into the printer, from a PC via a parallel cable

The Swapbox method is covered in a separate manual. In this appendix, we will concentrate on the second method.

If there is any firmware already on the IC card, it will be overwritten.

#### *Preparation*

In summary, the procedure is as follows:

1. Make a byte-swapped file of the firmware file on a PC.
  - Use the Byte Swap button in the Stinger Service Utility.
2. Copy this file from the PC to an IC card plugged into a G031 or G032 printer, via a parallel cable.
  - The computer must be connected to the printer with a parallel cable.
  - The IC card must be connected to the IC card adapter before being plugged into the printer.
  - Use either the Stinger Service Utility (for use with Windows systems) or MS-DOS (use the 'copy /b' command).

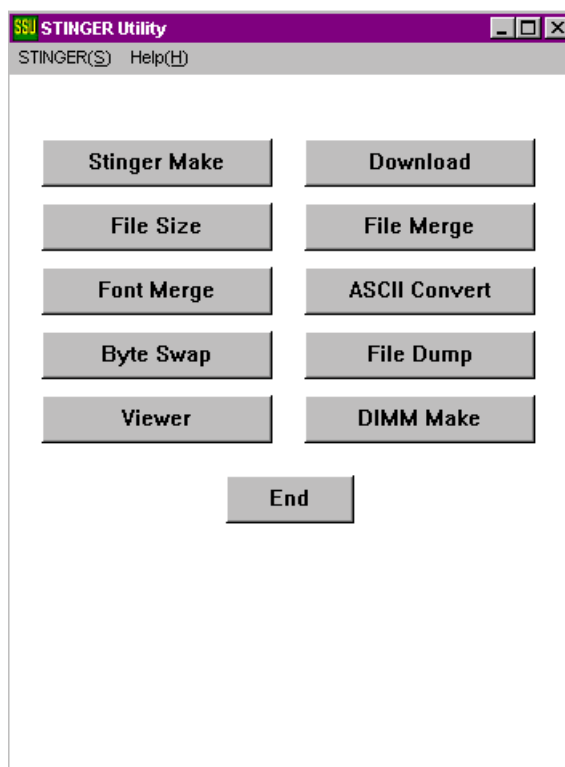
**NOTE:** When using the Windows utility, all Windows utility files must be copied to the same directory.

When using MS-DOS, download the download.hed file first (supplied with the Stinger Service Utility), then download the controller firmware file.

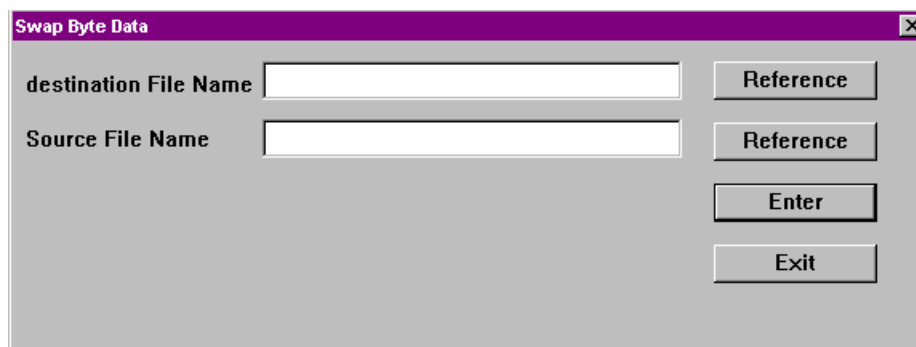


**Byte Swap Procedure**

1. Start the service utility (click 'stinger.exe' or the SSU icon)



2. Click the Byte Swap button.



3. Select the source file name (eg. P3card.rom) from the file list.
4. Enter the destination file name (eg. P3carddwn.rom).  
**NOTE:** Any destination file name can be used. However, the recommended file name is XXXdwm.rom. Using a standard naming system such as this will prevent confusion later.
5. Click Enter then click Exit. In the source file directory, XXXdwn.rom is created as the byte-swapped file.

USING AN IC CARD

***Downloading to the IC Card***

The firmware can be downloaded either with the Windows SSU utility or using MS-DOS.

***Stinger Service Utility***

First, prepare the printer.

1. Turn off the printer.
2. Connect the IC card to the IC card adapter, then connect the adapter to the option bus connector on the printer control board.  
**NOTE:** G031 has two option bus connectors. The left side connector is used for the downloading.  
Do not turn DIP SW 1 on, or the printer will boot from the IC card.

3. Turn the printer on while pressing the “On Line” key and “Menu” key together to enter the service tool menu.

Service Tool  
1. Test Print

4. Use the “arrow” key to select “Copy to card”.

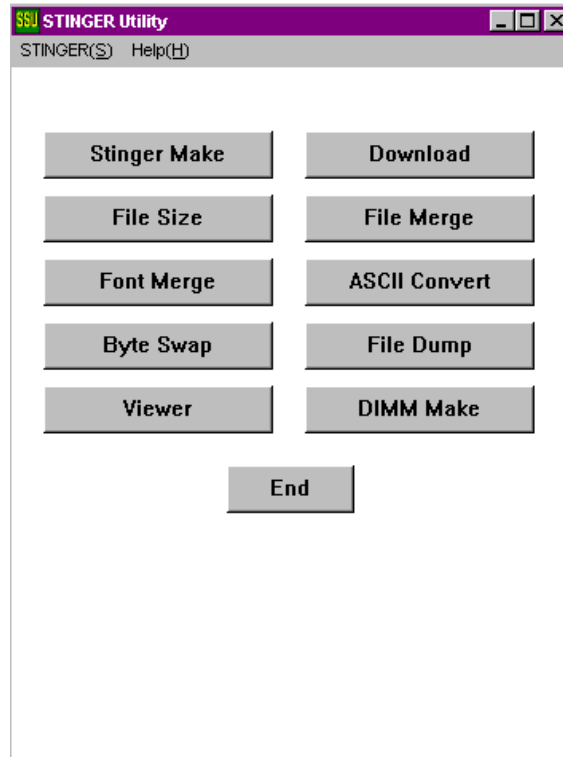
Stinger Service  
3. Copy to card

5. Press the “Enter” key then the “Form Feed” key.

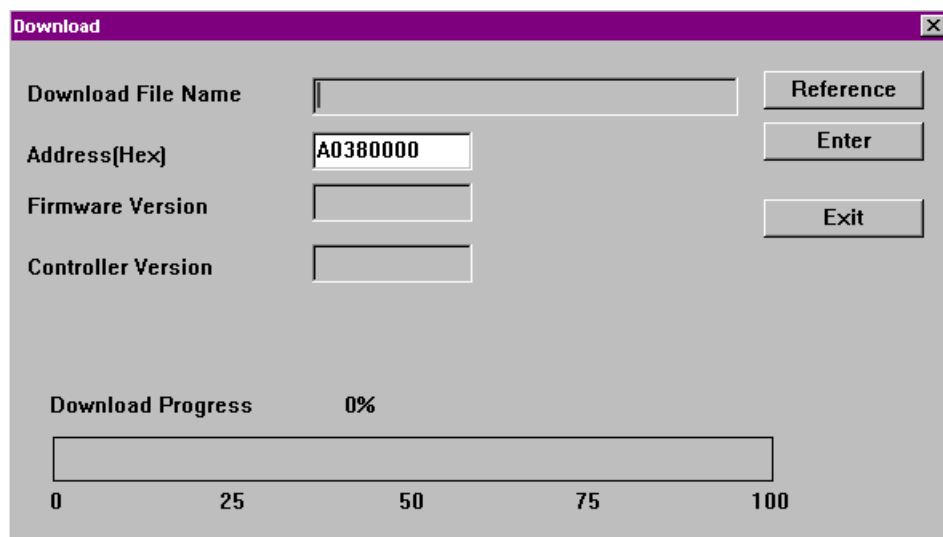
Please Download  
Wating

Second, prepare the PC

6. Start the utility (click stinger.exe or the SSU icon). The downloading utility window is opened.

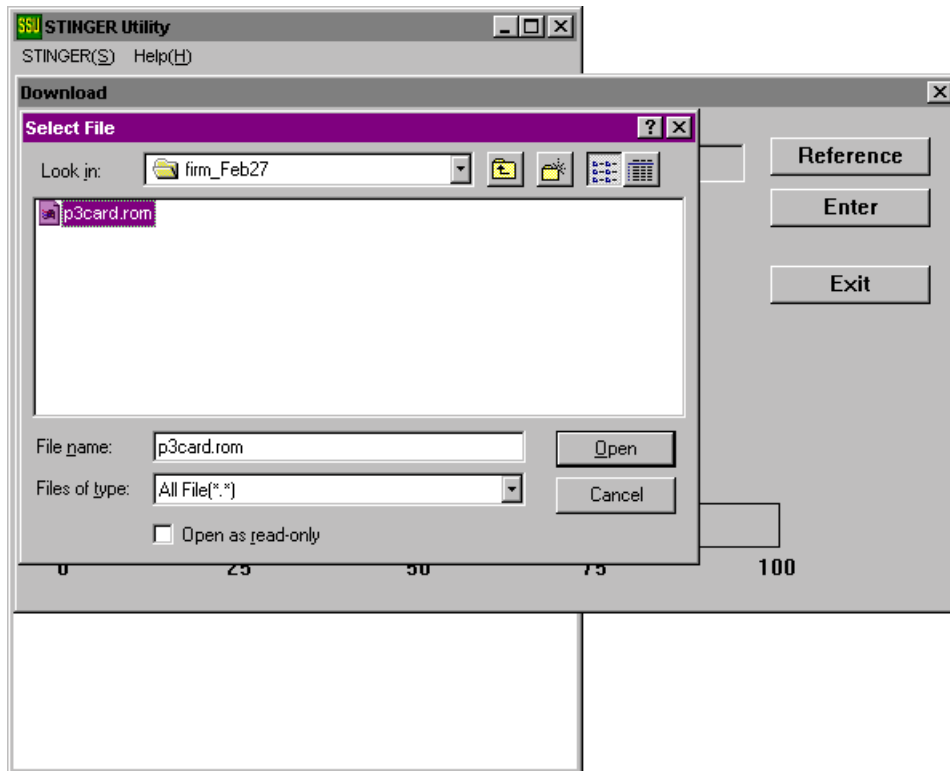


7. Click the Download button in the Stinger utility window. The download window is displayed.



## USING AN IC CARD

8. Click the “Reference” key and select the firmware file that you wish to download (eg. P3cardwn.rom).



**NOTE:** Only a byte-swapped file can be used for the download.

9. Then click the Enter button. The download is started.
- The bar in the download window of the SSU goes up to 100 %.
  - The finishing message is displayed in the Windows utility.
  - When the downloading is finished, a message is displayed on the printer.

Downloading Dat  
Wait 60

Successfully

10. Turn the printer off then on, and enter the service program mode.
11. Print the log print and check the controller firmware version.
12. Return to the user mode.

**NOTE:** There are two ways to go back to user mode from the service tool mode.

- 1) Press the “▲/▼” keys together. Then press the “Form Feed” key and the “Escape” key together. Then the initialization will start.
- 2) Turn the printer off and then on.

### **1.3.2 DOWNLOADING FROM THE IC CARD TO THE PRINTER**

This is explained in 'Downloading New Controller Software' in section 4 of the service manual.

## USING A DIMM

## 1.4 USING A DIMM

### 1.4.1 PREPARING THE DIMM

**Preparation**

In summary, the procedure is as follows:

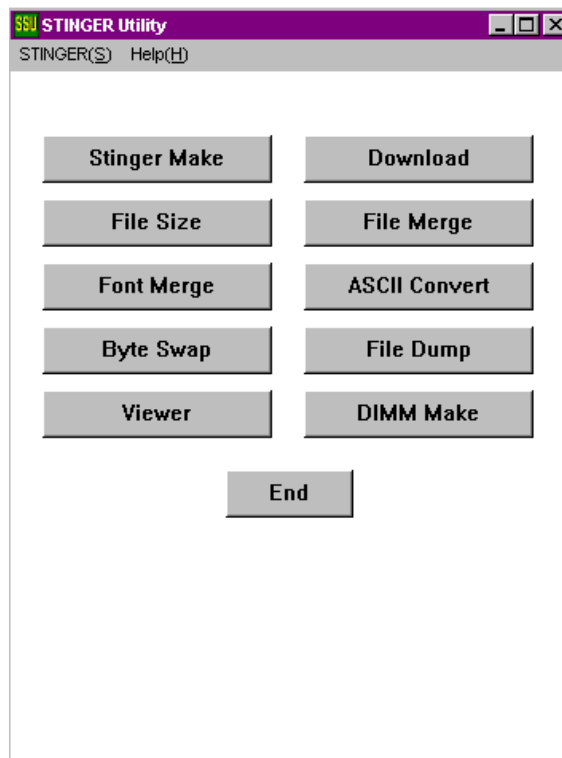
1. Make a byte-swapped file of the firmware file on a PC.
  - Use the Byte Swap button in the Stinger Service Utility.
2. Copy this file from the PC to a DIMM card plugged into a G031 or G032 printer, via a parallel cable.
  - The computer must be connected to the printer with a parallel cable.
  - Use either the Stinger Service Utility (for use with Windows systems) or MS-DOS (use the 'copy /b' command).

**NOTE:** When using the Windows utility, all Windows utility files must be copied to the same directory.

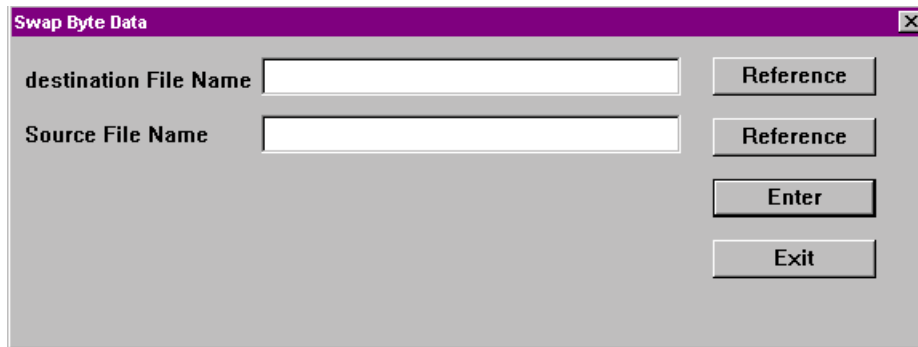
When using MS-DOS, download the download.hed file first (supplied with the Stinger Service Utility), then download the controller firmware file.

**Byte Swap Procedure**

1. Start the service utility (click 'stinger.exe' or the SSU icon)



- Click the Byte Swap button.



- Select the source file name (eg. P3card.rom) from the file list.
- Enter the destination file name (eg. P3carddwn.rom).  
**NOTE:** Any destination file name can be used. However, the recommended file name is XXXdwm.rom. Using a standard naming system such as this will prevent confusion later.
- Click Enter then click Exit. In the source file directory, XXXdwn.rom is created as the byte-swapped file.

### ***Downloading to the DIMM card***

The firmware can be downloaded either with the Windows SSU utility or using MS-DOS. Any firmware already included on the DIMM card will be overwritten.

### ***Stinger Service Utility***

First, prepare the printer.

- Turn off the printer.
- Change DIP SW1 to ON on the printer control board.
- Connect the IC card to the IC card adapter, then connect the adapter to the option bus connector on the printer control board.  
**NOTE:** G031 has two option bus connectors. The left side connector is used for the downloading.  
 The IC card must contain firmware for the printer; a blank IC card will not boot up the printer.
- Plug the DIMM card into the printer control board.
- Turn on the printer. Then the printer will boot from the firmware in the IC card.
  - The service menu will appear as follows.

Stinger Service  
 1. Update Firmwr

USING A DIMM

6. Use the “arrow” key to select “Copy to DIMM”.

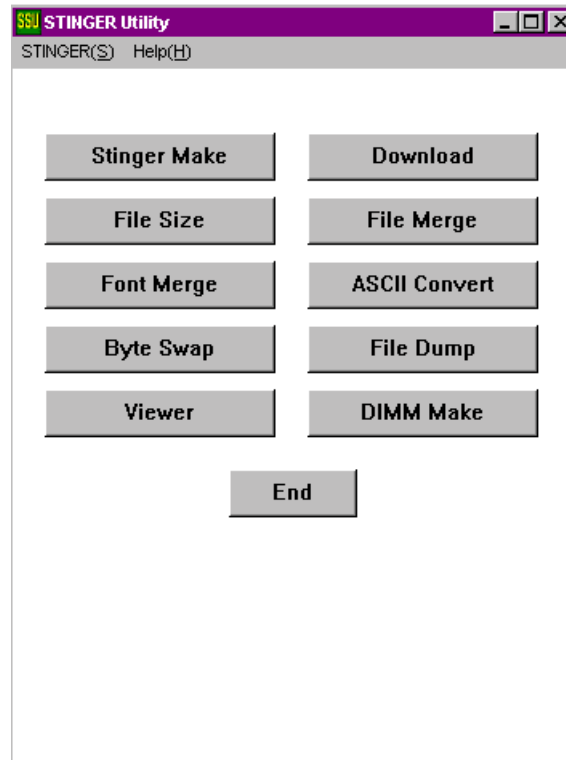
Stinger Service  
3. Copy to DIMM

7. Press the “Enter” key then the “Form Feed” key.

Please Download  
Waiting

Second, prepare the PC

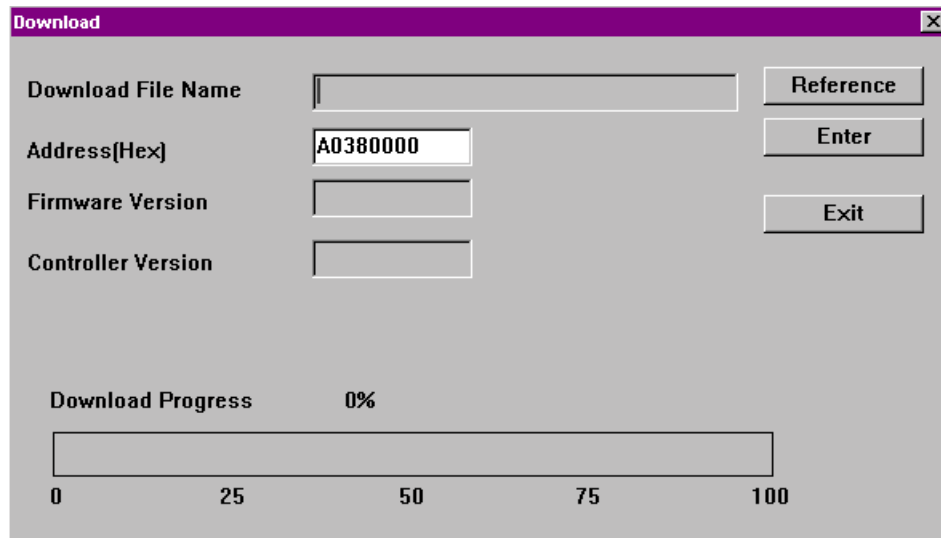
8. Start the utility (click stinger.exe or the SSU icon). The downloading utility window is opened.



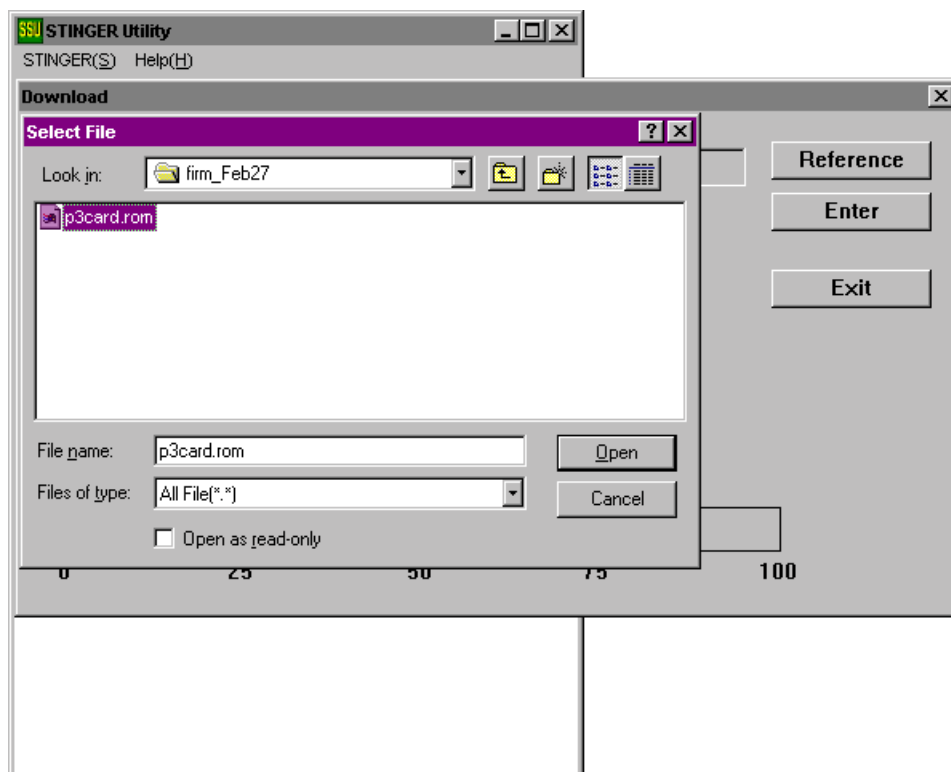
9. Click the Download button in the Stinger utility window.



10. The download window is displayed.



11. Click the “Reference” key and select the firmware file that you wish to download (eg. P3cardwn.rom).



**NOTE:** Only a byte-swapped file can be used for the download.

12. Then click the Enter button. The download is started.

- The bar in the download window of the SSU goes up to 100 %.
- The finishing message is displayed in the Windows utility.
- When the downloading is finished, a message is displayed on the printer.

Downloading Dat  
Wait 60

Successfully

13. Turn the printer off then on, and enter the service mode.

14. Print the log print and check the controller firmware version.

15. Turn the printer off and then on to return to the user mode.

The DIMM card now contains new firmware. The following procedure explains how to install the new firmware into the printer's flash memory.

### 1.4.2 DOWNLOADING FROM THE DIMM TO THE PRINTER

The firmware on a DIMM card can be copied to the flash ROM inside the printer. To install the firmware, use the printer's service tool menu as shown below.

**NOTE:** The printer cannot boot from a DIMM card.

1. Turn off the printer.
2. Plug the DIMM card into the printer control board.
3. Turn the printer on while pressing the "Online" and "Menu" keys together, to enter the service tool menu.

Service Tool  
1. Test Print

4. Use the "arrow" key to select "DIMM to Memory".

Service Tool  
5. DIMM to Memory

5. Press the "Enter" key.

5. DIMM to Memory  
Sure?

6. Press the "Form Feed" key. Then downloading starts.

STINGER version  
Wait

7. This message shows that downloading has finished successfully.

STINGER version  
Successfully

8. Turn off the printer.
9. Detach the DIMM card.
10. Turn the printer on again and enter the service mode.  
**NOTE:** If SC2800 appears, you forgot to take the DIMM out.
11. Print the log print and check the controller firmware version.
12. Return to user mode.

**NOTE:** There are two ways to go back to user mode from the service mode.

- 1) Press the "Form Feed" key and the "Escape" key together. Then initialization will start.
- 2) Turn the printer off then on.

## 1.5 COPYING FROM A PC DIRECTLY

### 1.5.1 PREPARATION

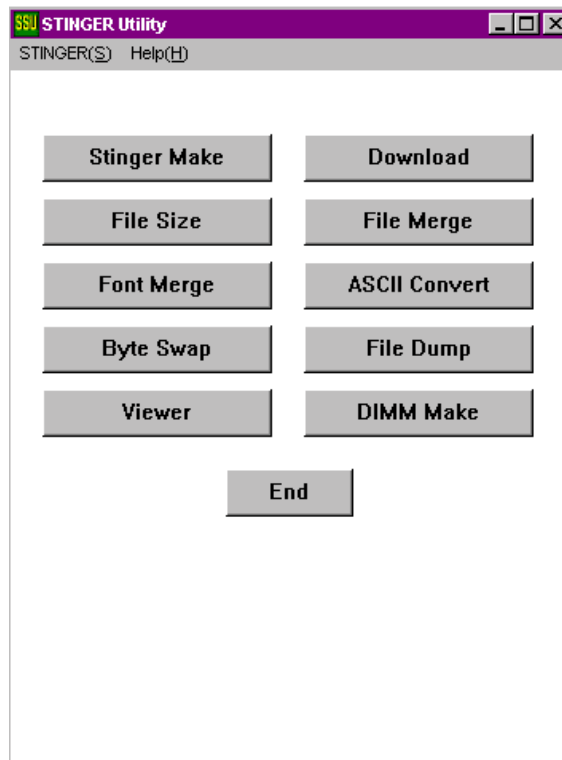
In summary, the procedure is as follows:

1. Make a byte-swapped file of the firmware file on a PC.
  - Use the Byte Swap button in the Stinger Service Utility.
2. Copy this file from the PC to the G031 or G032 printer, via a parallel cable.
  - The computer must be connected to the printer with a parallel cable.
  - Use either the Stinger Service Utility (for use with Windows systems) or MS-DOS (use the 'copy /b' command).

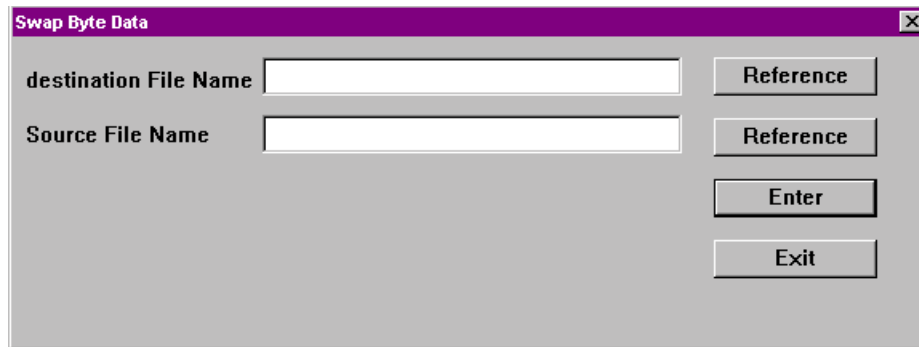
**NOTE:** When using the Windows utility, all Windows utility files must be copied to the same directory.  
When using MS-DOS, download the download.hed file first (supplied with the Stinger Service Utility), then download the controller firmware file.

#### ***Byte Swap Procedure***

1. Start the service utility (click 'stinger.exe' or the SSU icon)



1. Click the Byte Swap button.



2. Select the source file name (eg. P3card.rom) from the file list.
3. Enter the destination file name (eg. P3carddwn.rom).  
**NOTE:** Any destination file name can be used. However, the recommended file name is XXXdwn.rom. Using a standard naming system such as this will prevent confusion later.
4. Click Enter then click Exit. In the source file directory, XXXdwn.rom is created as the byte-swapped file.

## 1.5.2 DOWNLOADING TO THE FLASH MEMORY

### ***MS-DOS Procedure***

First, prepare the printer.

1. Turn the printer off.
2. Turn the printer on while pressing the “On Line” key and the “Menu” key together to enter the service tool menu.

Service Tool  
1. Test Print

3. Use the “arrow” keys to select Download.

Service Tool  
2. Download

4. Press the “Enter” key then press the “Form Feed” key.

Please Download  
Waiting

Then, prepare the host PC

5. Start DOS, or open a DOS window.
6. Do the following steps.  
C: > cd <path name for download.hed and controller firmware> <Enter>  
C: > copy /b download.hed prn <Enter>  
---- wait for five or more minutes ----

During this period, the printer display is as shown.

C: > copy/ b <download file name eg. XXXdwn.rom>  
prn <Enter>

The C: prompt returns.

Downlodng Data  
Wait :

7. When the download is finished, the printer’s display is as shown.

Successfully

8. Turn the printer off then on, then enter the service mode.
9. Print the log print and check the controller firmware version.
10. Return to the user mode.

**NOTE:** There are two ways to go back to user mode from the service tool mode.

- 1) Press the “▲/▼” keys together. Then press the “Form Feed” key and the “Escape” key together. Then initialization will start.
- 2) Turn the printer off and on.

**Windows Procedure**

First, prepare the printer.

1. Turn the printer off.
2. Turn the printer on while pressing the “On Line” key and the “Menu” key together to enter the service tool menu.

Service Tool  
1. Test Print

3. Use the “arrow” keys to select Download.

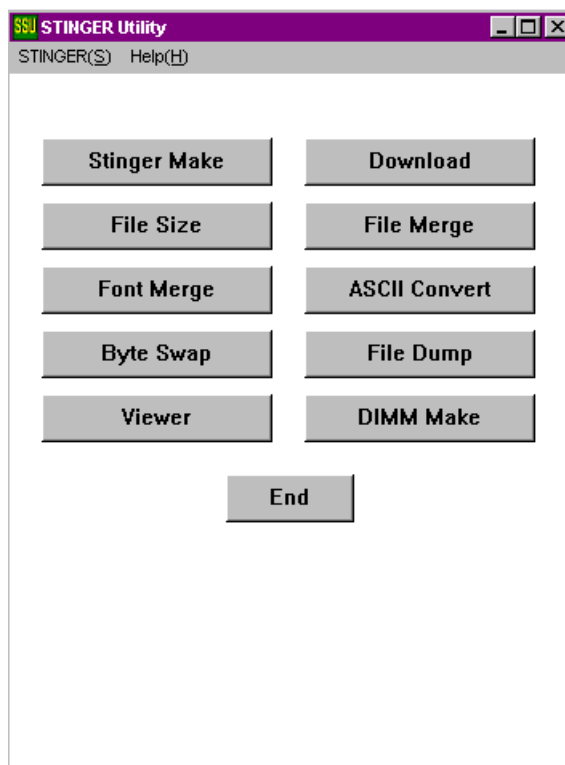
Service Tool  
2. Download

4. Press the “Enter” key then press the “Form Feed” key.

Please Download  
Waiting

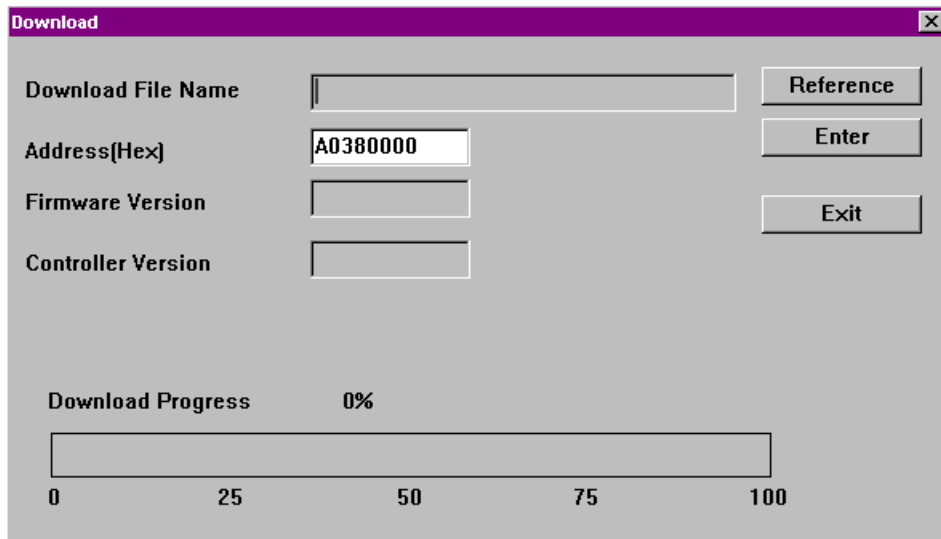
Second, prepare the PC

5. Start the utility (click stinger.exe or the SSU icon). The downloading utility window is opened.

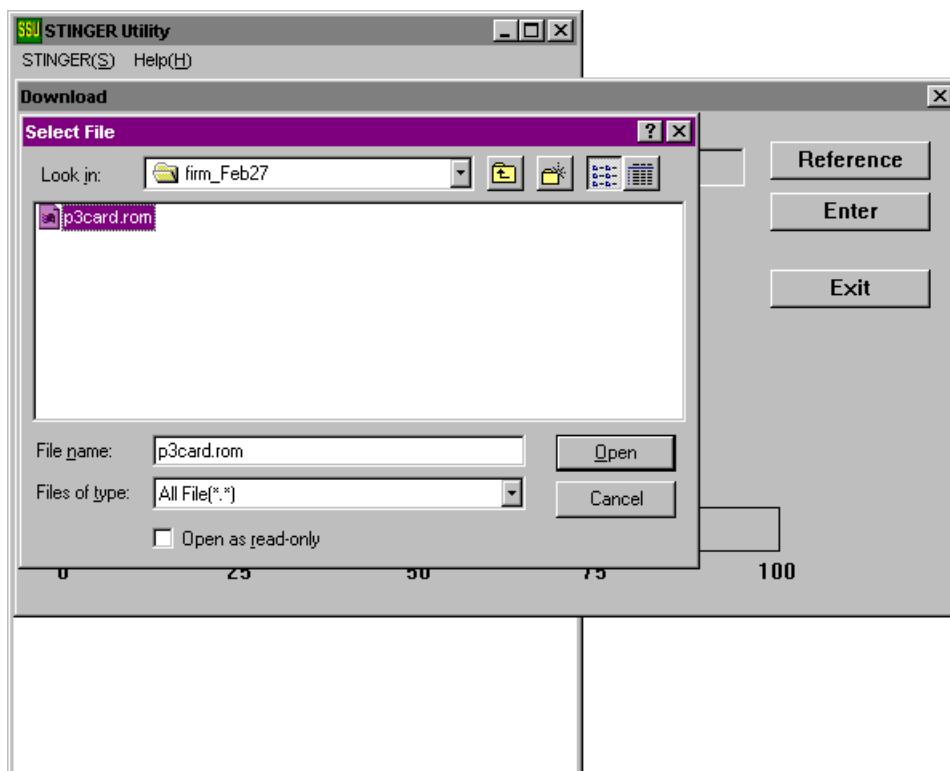


CÓPIA NÃO CONTROLADA  
COPYING FROM A PC DIRECTLY

6. Click the Download button in the Stinger utility window.
7. The download window is displayed.



8. Click the “Reference” key and select the firmware file that you wish to download (eg. P3cardwn.rom).



**NOTE:** Only a byte-swapped file can be used for the download.



9. Then click the Enter button. The download starts.

---- wait for a few minutes ----

During this period, the printer display is as shown.

Downloding Data  
Wait 60

- The bar in the download window of the SSU goes up to 100 %.
- The finishing message is displayed.
- When the download is finished, the printer display is as shown.

Successfully

10. Turn the printer off then on, and enter the service mode.

11. Print the log print and check the controller firmware version.

12. Return to the user mode.

**NOTE:** There are two ways to go back to user mode from the service tool mode.

- 1) Press the “▲/▼” keys together. Then press the “Form Feed” key and the “Escape” key together. Then initialization will start.
- 2) Turn the printer off and then on.

## 1.6 SSU TROUBLESHOOTING

This section explains problems that may occur when using the SSU (Stinger service utility).

When 'stinger.exe' or the SSU icon is clicked, SSU starts. The following error messages may appear when the download button is clicked. These errors are created by SSU.

1. "LPTx open error"
2. "File (filename.P00) Write error"
3. "File (filename.P00) Create Error"

### **Symptoms**

#### **1. "LPT2 open error"**

This may appear in a message window when the download button is clicked to start downloading.

SSU uses the lpt1 port to send the data. When the default printer is connected to the lpt2 port, for example, the SSU cannot send the data to lpt1 and it tries to send the data to lpt2. However, SSU cannot open lpt2.

The default printer must be connected to lpt1.

Countermeasure:

Connect the port of the default printer to lpt1 (use the port setting in the Details tab of the printer properties).

#### **2. "File (filename.P00) Write error"**

SSU checks the rom file attribute when it starts to send the data. This error message appears when the file attribute is read-only.

Countermeasure:

Open the file properties (using Windows Explorer) and uncheck the read-only attribute.

#### **3. "File (filename.P00) Create Error"**

SSU creates a temporary file in the same directory as the rom file. If the rom file is on a CD-ROM for example, SSU cannot create a temporary file. Also, if the rom file is in a network directory that is not shared, SSU cannot create a temporary file.

Countermeasure:

The rom file must be in a local directory.